The Formulation of Sustainable Transport and Movement Strategies - CASE STUDY The University of Tasmania (Sandy Bay)

Professional Project submitted by Nicola Clennett

as a requirement of the Masters of Town Planning at the University of Tasmania

November 1994.
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Note

Base Maps used for attachments for this paper are compiled from a number of sources.

The 1:10 000 Maps are taken from the Hobart Planning Scheme Base Maps - hence the thick black line along Sandy Bay Road.

The 1:25 000 Map is compiled from two of the Tasmania 1:25 000 Orthophoto Series.

The remaining Maps are compiled from a number of 1:2000 Orthophoto Maps of the area. These Maps have been significantly reduced and their scale cannot be determined.

These Maps are the only ones available for the area. Unfortunately the standard 1:5000 orthophoto series has not been compiled for this area.
Abstract

The Modern City of Western Society is currently confronting many issues that will determine its future form. For those responsible for 'controlling' development patterns, these issues are personified by the Sustainable Development Debate. Such debate is formulated upon a concern for the future ability of the earth's environment to handle society's growing pressures on its natural resources - earth, air, and water.

The process through which the Western City has developed has lead to the establishment of development patterns, and social habits that effectively threaten the maintenance of these systems. This Study is concerned with those development patterns and habits centred around transport patterns, aiming at the establishment of recommendations and strategies to alter current systems and to provide movement alternatives to communities.

For the purpose of practical implementation and more favourable community acceptance, the author chooses to consider a specific area with existing traffic problems as a Case Study. Such Case Study was the University of Tasmania's Sandy Bay Campus.

The University experiences traffic and parking problems associated with on-campus parking and street formations, and ease of access to the neighbouring suburban area. The Campus provides insufficient parking on site in an inadequate form resulting in an overspill of traffic into residential streets. Traffic and parking in the area visually degrades building forms and streetscapes. It physically separates local residents from their neighbours on the opposite side of the street, creating problems with noise and safety. Such concentration of traffic by the University and the Hobart City Council has placed the pedestrian, bicyclist and public transport patron into the 'too hard basket'. Services for these persons are substandard, illegible and often inaccessible.

With these concerns in mind, the author discusses the current theory on Traffic Calming - as a total streetscape issue - and Planning for Alternative Forms of Transport.

Considerations include:

(a) The implementation of street forms that cater for all intended users, the motorist, bicyclist, pedestrian and resident in a practical, safe and visually attractive manner;
(b) The advantages and disadvantages, implementation processes and relevance of public transit modes such as heavy rail, light rail and buses;
(c) The advantages and disadvantages of non-motorised transport - walking and bicycling, including the necessary considerations in their design.

With these considerations in mind, the Study then discusses the problems of the Study Area in detail, including the role of the historical pattern of development in the current problems. These discussions highlight the inadequacies of parking form, street design, public transport legibility, services for the pedestrian and bicyclist, and traffic control.

Chapter 5 therefore lists the options available to address these problems, within the umbrella of theory discussed:

(a) Consideration is given to the re-establishment of at least one of the
sportsgrounds to an alternative area of the title for the purpose of introducing a multi-level carpark, and further residential facilities;

(b) An alternative parking policy is recommended allowing equal access to on-campus parking through the payment of a minimal fee;

(c) A recommendation is made that pedestrian services both on-campus and off be improved through the use of paving, landscaping, and the introduction of street furniture and directional signage;

(d) Consideration is given to the lack of facilities for bicyclists and a recommendation made that services be upgraded through the introduction of segregated and shared footways both on and off campus, providing continuous separation from traffic along major traffic routes. In addition parking facilities are recommended for on-campus accommodation through the provision of a sheltered parking area.

(e) An alternative street system is recommended through the introduction of a number of street designs-based upon traffic calming techniques- providing improved visual amenity, reduced formation widths, safer and wider pedestrian facilities, segregated footways for bicycles, and improved safety at intersections

(f) Recommendations are made to improve the legibility of the Metropolitan Transport Trust Services and to upgrade the services provided by the intra-campus bus service.

Although many of the recommendations made are specific to the site, the strategies implemented will be applicable to any area experiencing traffic problems. Evenmoreo, however, the author hopes that the problems raised and issues discussed within the Study can act as catalyst for the formulation of traffic and movement strategies for implementation in areas not yet confronted with these concerns, this is the real issue for the Sustainable future of Cities.
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INTRODUCTION
Introduction

The City - an ever growing ever spreading mass of predominantly single detached private dwellings with their associated backyards connected by an ever widening, ever lengthening web of vehicle carriers.

(i)

Land Use Planning

City Planners of the late 20th Century have found themselves having to right the wrongs of the lack of or 'bad' planning decisions of the past. Planning has been forced back into a visionary role out of necessity for environmental protection. A lack of foresight and perhaps inadequacy of the current planning paradigm is leading the modern city to social, economical and environmental degradation.

Historically planning controls have been land use based, focusing on the minimisation of conflicts between different land uses to ensure the continuing social and physical health of the society. Such a paradigm was initiated through the advent of Industrialisation.

The Industrial enclaves resulting from the Industrial Revolution were the first signs of land use separation. As factories developed and grew, the place of work became increasingly separated from the home. Lack of transport (other than horse and cart) meant that the city form remained compact, relying heavily on pedestrian access to major land uses.

The advent of motorised transport (initially rail) led to a further separation of the home and work place. However, cities were still small, dependant upon rail, and horse and cart for access.

Total land use separation did not occur until the advent of the omnibus and following that, the motor car. The motor car allowed individuals to live further from their place of work, accordingly allowing alienation from the detrimental affects of these commercial and industrial areas (noise, smell and air pollution), and allowing the home to become a social, environmental and physical retreat.

In a country such as Australia where space was considered a limitless commodity, these retreats could be provided with relatively large areas of open space - the private backyard. Thereby allowing for the growth of a social, environmental and economical ideal - the Australian Suburban Dream Home.

(ii)

The Social, Environmental and Economical Impact

As cities spread and land uses became increasingly separated, society became immune to environmental concerns. The environmental and economical implications of such development patterns were highlighted by the environmental movement arising out of concerns in the 1960's and 1970's for the unsympathetic development of natural environments.

It was gradually brought to the attention of people in the planning and like professions that existing patterns of development largely supported by planning controls and guidelines were jeopardising the future of society:
(a) Low density suburban development patterns were utilising environmentally and economically valuable land and, by virtue of their physical dissociation from major land uses, were creating social isolation problems for persons without employment, or access to transport.

(b) Technological developments were using and emitting an increasing variety of environmentally precious, or damaging chemicals with little governmental control of this usage.

(c) Post Industrial suburban development and the domination of the car had led to the establishment of a city form dependant upon the continued use of natural resources (animal, vegetable and mineral) and the emission of environmentally degrading fumes.

(d) The unchecked growth of Industrial development, together with the domination of the motor car had led to a general decrease in the environmental and social amenity of 'city dwellers'. Lack of control over Commercial and Industrial developments had led to city centres that failed as people friendly environments and were not conducive to social integration. The suburban development form, meanwhile had become dominated by the motor car, and was beginning to indirectly encourage individual isolation rather than community interaction.

On a global scale these development patterns have led to large scale depletion of natural resources (flora and fauna), a realisation of the finite status of many mineral resources, and a degradation of air quality. This has resulted in a depletion of the ozone layer, the production of acid rain, the potential for substantial global warming, as well as the loss of a true social interaction between community members. Out of these realisations came a sense of urgency to alter current systems to improve the way we treat the environment whilst maintaining an acceptable "social quality" - out of this urgency emerged the term Sustainable Development.

(iii)

Sustainable Development

Sustainable Development is a form of development which allows for the enhancement of and/or maintenance of existing social systems and advancement of economical systems designed to reduce the use of natural resources and to encourage ecological evolution.

Sustainable Development is a term that conjures up a variety of meanings, the specific emphasis of which is dependant upon an individual's theoretical and ideological background. The definition used in this paper is from an ecocentric viewpoint - a definition that places the environment first. It is argued that this viewpoint is necessary to ensure the continued development of the built and natural environment, for it is suggested that it is through inadequate regard for the environment that current problems have arisen.

It is therefore within the underlying philosophy of Sustainable Development that the planning profession has started to focus on means of moulding the future development of cities - curbing their physical growth, improving their liveability, offering alternative housing

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1 The Term "Development" is used in this Study to refer to both physical construction and the social evolution of thought, not necessarily growth.
types and encouraging the revitalisation of inner cities - with the aim of defining forms of development that can be sustained environmentally, economically and socially. In this way the profession is setting goals that can give some concrete form to a Sustainable Development Strategy.

(iv)

**Sustainability and Transportation**

The most difficult of goals however, and the one least tackled is a societal change towards transportation. As discussed previously, current physical and social issues in western cities have largely been formulated through the popularisation of the private car. What society is afraid to confront, however, is the environmental consequences of such transportation methods.

"Global Warming" or "The Greenhouse Effect" are terms that are familiar to most persons. The gases responsible for these environmental effects are produced in the natural environment through various climatic processes. These gases, the major component of which is Carbon Dioxide, effectively absorb and re-emit otherwise lost infra-red radiation (heat), allowing the lower levels of the atmosphere to stay warmer than they would otherwise. An increase in the amounts of these greenhouse gases would allow for further absorbance of lost heat, thereby increasing atmospheric temperatures.

An enhancement of greenhouse gases has been occurring at an increasing rate during the last 50 years as a result of human based activities - such as agriculture, mining, industry, commerce, and transport. The greatest concern in the production of these gases is the increase in Carbon Dioxide levels\(^2\). Within Western Countries such as Australia, and the United States, the main source of this production has centred around the increased usage of private motorised transport. The burning of fossil fuels effected by petroleum transport methods is the main source of man-induced carbon dioxide production.

The volume of production of such gases coupled with the continued use of non-renewable resources (petroleum and other oils) places transportation policies towards the top of the "must do" list of Sustainable Development policies.

(v)

**The Australian Contribution**

In October 1990 the Australian Federal Government adopted an Interim Planning Target to reduce Greenhouse gas emissions by the year 2005 to 20 percent below the 1988 levels - noting that Australia's per capita emissions from transport fuels are the third highest in the world. To date this policy has had little if any effect on the day to day use of transportation.

Focus must be placed upon strategies that reduce the use of (and provide alternatives to) private vehicle transportation, as well as providing alternatives to the existing methods of accommodating these vehicles (street design and carparking). If such strategies can be formulated and implemented Australia will be a step closer to becoming an environmentally, economically and socially sustainable society.

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\(^2\) Australian and New Zealand Environment Council 1992 p.3
The Implementation of Sustainable Transport Strategies

The adoption and formulation of transport policies must be carried out on a scale large enough for the benefits to be both economically and environmentally viable. As an introductory approach it would not be wise to attempt to change the habits of society on a nation-wide or even state-wide basis - such approach without the benefit of previous public experimentation would have little if any effect - for it is not until the general public can be shown the mutual benefits of sustainability policies that any attempt will be made to alter the existing patterns of behaviour.

Policies must be adopted on a scale large enough to be frequently visible to the public eye and in a manner which directly affects it. They should (by definition) cover sites or locations currently subjected to traffic and parking pressures, and by default should be large scale "people attractors". Within the Western City these requirements would single out major land uses/areas, such as business or commercial centres, industrial institutions and educational institutions. The applicability of each land use to any such study would, of course, depend upon its physical location, historical problems, and importance within the society.

Commercial/Business Districts

The planning and development of commercial centres is highly visible to the public. Within Tasmania, for example, the Central Business District of Hobart has recently been the subject of extensive studies and reports on topics ranging from pedestrian access to the potential for residential development.

This work has highlighted the difficulty of planning for an area of diverse ownerships and land uses.

Private Institutions

Control over parking and traffic associated with private institutions (industrial and commercial, and educational) stops with their compliance with any relevant planning codes - the possibility of imposing controls not legally required would be difficult unless universally applied. The author suggests that such institutions concerned with commercial (and therefore economical) competition generally would not spend money to benefit the wider community (and therefore possibly their competitors) unless their personal gain outweighed any other. Any recommendation to impose restriction or alter systems could therefore be met with closed minds.

Public Institutions

Public Institutions encompass educational and scientific, transport, and welfare bodies. Such bodies are owned and operated by either the State or Federal Governments, thereby allowing an opportunity for blanket policies, and better control of development from a Local Government point of view.

Within this category, Public Universities are probably the most substantial generators of traffic. With Australia's increasing population and high unemployment Universities are experiencing a growth in numbers. Concurrently all Australian States are experiencing increases in private vehicle ownership\(^3\). The result has been an increase in traffic directly associated with Universities. Information received from a

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\(^3\) Australian Bureau of Statistics 1994, p.644
number of Australian Universities has suggested that the issue of parking accommodation is a concern for all University Councils. Of the Universities studied none provided parking for more than 19% of all patrons, (well below the demands of each Campus) and all discussed economical, and/or physical constraints for additional provision. The locations of the Campuses associated with these Universities play a large part in their parking problems. Some Campuses (Uni. South Australia - City, Uni. Technology Sydney) are located within City Centres and are extremely limited in provision. The amenity of these Campuses is therefore directly associated with the relationship of the Campus with the City traffic system.

The majority of the Campuses, however, are located in middle to outer suburbs, and accordingly are to a greater or lesser extent limited in future expansion. All have a measurable affect on the amenity of the surrounding residential areas through the imposition of transient and parked traffic.

The implementation of sustainable development policies for such sites would not only be visible on a regional scale but, by virtue of their Federal or State ownership, could initiate nation-wide strategies. Accordingly the investigation of such a site within Tasmania practically accessible for the purposes of this Study should provide the opportunity for Universities, large Institutions, and Commercial centres Australia-wide to become fully aware, and hopefully inspired by the recommendations and concepts of this Paper.

(vii)

The University of Tasmania - Sandy Bay Campus

The Sandy Bay Campus of the University of Tasmania is one of the largest generators of traffic in the Hobart area. In 1993 student and staff numbers totalled 6663 and 1137 respectively. Within a city such as Hobart with a population of 183 500 such a number cannot fail but to have a large impact upon parking and traffic patterns of the region. Conversely, any improvement made to University transport patterns should have a substantial affect on regional traffic problems.

(viii)

The Problem in General

The growth rate of the University is demonstrated in Table I.1. It can be seen that in the six year period from 1987 to 1992 total patron numbers have increased by 20 percent. This increase is indicative of the last 15 years. During the same period, data available for the whole of Tasmania suggests that car ownership per head of population has increased by 5.8 percent. The rising population of University patrons and the corresponding increase in vehicle ownership has led to:

(a) an increase in proportion of private vehicles being used for access to the Campus;

5 Jackson, Teece, Chesterman, Willis and Graham 1994 p 27.
6 Australian Bureau of Statistics 1994 Fig.6.3
7 For the remainder of the paper the term "University" will be used in relation to the Sandy Bay Campus of the University of Tasmania only.
8 For the remainder of the paper the term "patron" is to be used to refer to all staff and students of the Campus.
9 Australian Bureau of Statistics 1994 Fig. 23.7

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4 Universities of: South Australia, Wollongong, Western Sydney (Nepean), Technology Sydney, Queensland, and Western Australia
TABLE I.1

PATRON NUMBERS 1987 - 1992

<table>
<thead>
<tr>
<th></th>
<th>1987 Numbers</th>
<th>1992 Numbers</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students - Hobart</td>
<td>5242</td>
<td>6663</td>
<td>27</td>
</tr>
<tr>
<td>Staff - Hobart</td>
<td>832</td>
<td>937</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>6074</td>
<td>7600</td>
<td>20</td>
</tr>
</tbody>
</table>

Source: University of Tasmania 1992
(b) an overall increase in vehicles travelling to and from the Campus;

This level of usage together with the form in which provision has been made for the private vehicle, and the dominance of this mode of transport in the land use patterns of the area, has resulted in the emergence of a number of problems:

(a) The high traffic volumes associated with the University have an on-going impact on the production of Greenhouse Gases and other environmental pollutants, as well as the increased usage of non-renewable fuels;

(b) The residential amenity of suburban streets is being affected by an overspill of student and staff parking;

(c) The provision of parking areas in the form of surface parking has required the use of large areas of land required for other forms of development;

(d) The volumes of traffic generated by the University has a substantial impact upon the flow and loads of traffic on regional streets, and;

(e) The dominance of the motor car has meant a lack of consideration being given to more environmentally friendly forms of transport, such as public transport, bicycling and walking.

An attempt to address these problems could have a substantial affect upon not only the amenity of University patrons but on surrounding suburban areas, regional amenity and the whole of the City both directly and indirectly.
Stance

The University of Tasmania is one of the largest institutions in the State. Together with the CSIRO and the Australian Antarctic Division it is also one of the few public research centres operating in Tasmania. The population size and relative location of Tasmania are such that major scientific research bodies in general, are not attracted to the State. As a result, the Tasmanian community regards the University as one of the major sources of State scientific and developmental initiative. The author believes that this community attitude towards University work could be fostered by the University body to introduce policies and strategies that are creative and demonstrative in their design to address the problems discussed in Chapter 4.

The chance is available to the University to become visionary in its attitude towards development and growth as a response to world issues. If the University were to recognise its moral responsibility emanating from its position in Tasmanian society it could use that position to address the issues of sustainability as a means of setting an example for other institutions and communities to copy and follow.

The author therefore sees this paper as an opportunity to discuss the problems currently confronting the University as a Case Study to aid in the formulation of initiatives for solutions to traffic and parking issues that can act as a model for the reminder of the City and State in the search for a sustainable society, environment and economy.

In general therefore the paper aims to:

(a) Identify options available to the University and suburban community to improve and control the problems associated with University traffic and parking

(b) Develop and formulate recommendations to reduce the overall use of energy of greenhouse emissions in travel to and from the Study Area.
Chapter 1

The Study Area
Chapter 1 - The Study Area

1.1 Physical and Statistical Characteristics

The University of Tasmania is the sole University in the State. As a result of its amalgamation with the Tasmanian State Institute of Technology in 1990 - 1991 the University is currently comprised of four campuses: Newnham (Launceston); Centre for the Arts; Conservatorium of Music; and Sandy Bay (Hobart). The largest of these campuses, Sandy Bay is the oldest of the four. It is situated in an inner suburb of Hobart from which it takes its name. Sandy Bay is one of the older suburbs of Hobart and is populated by persons in the middle to high income brackets (with a substantial number of students in the vicinity of the campus). The Campus is located approximately three (3) kilometres South of the Hobart GPO and lies on the two main traffic routes running southwards along the Derwent River from the Central Business District (CBD).

This Study takes consideration of the University location within the City of Hobart, together with its association with the surrounding suburban areas. The boundary of the Study Area is defined on Map 1.1. It is noted that the nature of the problems concerned does not allow the boundaries of the Study Area to be definitive. The Study Area must be understood for its location within the traffic system and an acknowledgment made that proposed alterations to patterns must include considerations of regional systems. To allow in-depth study and the formulation of recommendations, however, it is necessary to delineate a detailed area whilst acknowledging factors from outside this area. The detailed area defines the limit of land markedly physically affected by traffic associated with the University.

The majority of the Study Area has a gradual slope toward the Derwent River in the East.

Land use in the area is mixed but is dominated by older established dwellings in residential blocks. The area includes approximately 415 residential lots of varying size in two street 'blocks' to the north and south of the University site.

The area to the North bound by Lord Street, Proctors Road, French Street, and Sandy Bay Road is an inner residential area with a range of dwelling unit styles including large established family houses, smaller houses and flats - this area is serviced by a small local shop.

The area to the South is bounded by Nelson Road, Churchill Avenue, and Sandy Bay Road. This area is a well established residential subdivision accommodating single family detached houses. It is dominated by two educational institutions - the Hutchins School and Mount Carmel School. The former is the largest male private school in Hobart whilst the latter is a small girls private school.

The University bisects these two areas. Its 98.9 hectare title extends up a gully between Mount Nelson and Tolmans Hill to the main highway South of Hobart, the Southern Outlet. The former use of the land as a rifle range gives rise to its wedge shape.
The two main traffic routes traversing the Study Area are Churchill Avenue and Sandy Bay Road. These two primary streets are supported by a number of secondary streets in the essential grid pattern of the suburb.

1.2 Statutory Control

Development of the entire Study Area is controlled by the City of Hobart Planning Scheme 1982 (The Scheme) as implemented by the Hobart City Council.

The Scheme divides the Study Area into four precincts, as described on Map 1.2. Three of these precincts are Residential - described as Precincts 27A, 27B and 30B, with the fourth, 29, being the University Precinct. The Scheme provides Statements of Desired Future Character (in terms of building form) for each of these precincts, these are listed in Appendix I. More relevant to this Study, however, are the regulations and objectives relating to building height, carparking and general movement:

(a) Height - The maximum height of buildings in all zones is set at 4.8 metres in accordance with Table C.1. This maximum can be relaxed only at the discretion of the Hobart City Council.

(b) Traffic, Access and Parking - Part E of the Scheme allows Council to require a minimum number of off-street parking spaces to be provided as part of any development within the Study Area. The requirements relevant to use groups within this area are outlined in Appendix 1. Although Council is given the ability to reduce this requirement, it has no right to receive payment-in-lieu of

(c) Movement - Clauses E.9.7 and E.9.8 discourage commuter traffic, transient and stationary in the local streets, of the residential areas suggesting this traffic should be restricted to the primary streets.

Clause E.9.16 encourages further landscaping of car parks on the University Campus.

All three Clauses encourage the provision of service for the pedestrian and bicyclist.
Chapter 2

TRANSPORT PLANNING
Chapter 2

Transport Planning

2.1

The Function of Transport

David Engwicht in his book *Towards the Eco-City* questions the true function of transport. He suggests that modern society in all aspects of life is engrossed with the means rather than the ends, and accordingly determines that "movement rather than facilitating exchange has become the goal of transport". 10 This belief, he suggests, is born from the democratic aim of "freedom of access" - the assumption that freedom of movement allows access to all that is necessary for personal and social wellbeing. Engwicht highlights the inadequacies of this assumption by discussing the rights of the prisoner who is afforded the right to move but cannot achieve physical and social freedom - these goals he suggests can only be achieved through personal and communal interaction.

The dominance of the car has limited such interactions, restricting personal freedom to effectively preorganised situations. It has removed some of the spontaneity of social and environmental interaction achieved through alternative patterns of travel. Affectively it is limiting our personal and communal social development and cannot be considered a socially sustainable form of development.

This loss of social interaction and communal development can be seen most vividly in the modern suburb of western society. These areas are physically determined by vehicular movement patterns. Streets provide a barrier between residences creating an 'ownership' vacuum - they belong to no-one but the cars which traverse them. Residents of the suburb are dominated by the presence of the car, affected by the noise and physical dangers it creates, whilst being appreciative of the opportunities it provides. Such movement opportunities allow for organised interaction on a scale much greater than the immediate residential surrounds - the necessity for interaction with those living nearby has almost been removed. The modern suburban street is not one on which children can explore and play, and parents can talk - the chance to establish a bond with the neighbourhood environment, including the people does not exist - the placeness of the suburb has been lost.

Whilst modern suburbs continue to develop as collections of individual nirvana with little, if any, social interaction, any chance of implementing policies aimed at their physical and social enhancement will be restricted. Sustainable development of these areas must involve a communal ownership of natural and built environments. This cannot be achieved without changes to the current transport patterns and forms.

2.2

The Role of the Residential Street

(a) Its Current Role

The suburban street has historically been broad and straight in its design, providing an alternative to the narrow streets of...
pre-industrialisation. Ease of access through these streets has proved an incentive for through traffic (traffic using the local streets to gain faster access to areas outside the suburban boundaries). The use of these streets by this traffic additional to local usage means that traffic volumes often exceed those for which the streets were designed. As a matter of policy engineers and planners have tried to compensate for this congestion and high traffic loads by widening and upgrading the streets. In reality these policies improve the attractiveness of the street to traffic providing an alternative route to the primary streets of the traffic system. These wide residential streets, both in static (visual) and dynamic (movement of traffic) terms, tend to separate opposite sides of the streets rather than unify them.

(b) Its Intended Role
As discussed previously the local residential street has historically been a place of community interaction, recent development patterns have removed this social function of the street.

Nassau make the suggestion that suburban streets provide the dominant impression of any community. They suggest that a street should be able to foster a togetherness that encourages a common interest in community affairs. The street must therefore be assured of retaining or retrieving its social function to provide for social contact of various kinds. As such it must service widespread public demands as well as those of the private individual - as the interface between these two domains it must:

(a) Accommodate vehicular traffic;

(b) Accommodate pedestrians and bicyclists;

(c) Provide a social function deriving from the use of local street activity spaces;

(d) Accommodate stationary vehicles.

All suburban streets are designed to accommodate limited levels of traffic and parking. The pedestrian and bicyclist, however, is significantly ignored, the public spaces of suburbs have been dedicated to the motor vehicle, leaving little space for alternative activities. This dominance of the car has initiated a trend through which alternative means of movement are becoming less popular and therefore less viable, thereby increasing dependence upon the car. This is a pattern which is unsustainable.

To counteract this dominance it is necessary "to adapt the volume, speed and behaviour of traffic functions of the streets through which it passes, rather than adapt streets to the unbridled demands of motor vehicles". Transport of cars must become the secondary function of streets. Primarily residential streets should focus upon providing services for public transport, the bicyclist, the pedestrian and the resident.

2.3 What Solutions?
In their work, Winning Back the Cities Peter Newman and Jeff Kenworthy discuss three worldwide solutions for cities facing up to the "multiple problems of car

11 Colman 1978 p 58
12 Nassau 1976 p12
13 Colman 1978 p 57
14 Devon County Council 1991 p10
15 Devon County Council 1991 p12
dependency" with an attempt at adopting policies within Australian Cities to provide a more livable and sustainable future. They briefly define these solutions as follows:

(a) Traffic Calming - encouraging community life by turning streets into more pedestrian friendly environments;

(b) Light Rail - a modern multiple carriage tram running on dedicated Rights-of-way. A convenient, attractive and environmentally friendly mass transit;

(c) Urban Villages - European Style developments which combine medium and high density housing with diverse commercial facilities in car free environments.

The concepts of traffic calming and light rail are central to the issues of this paper, and are discussed further in the following pages.

It must be recognised that planning for Urban Villages involves many aspects outside transport planning, and although some comments will be made about the necessity for coordinated land use and transport planning, it is beyond the scope of this paper to detail the appropriateness of the Study area for such a development.

2.4 Traffic Calming

"The crucial question to be put here is whether or not the city which was formerly built on the human scale and in which the street existed primarily as a means of contact is to be replaced by a megapolis where the dimensions of the street are on the scale required for its primary use by mechanical transport.

The urban environment should again become a place favourable for human encounter; for looking around, listening and talking to people, walking about and sitting down. Streets and squares should once again be treated as outside rooms within the city as places where the opportunity of contact "between people is the primary consideration."

To many the concept of traffic calming conjures thoughts of speed humps, roundabouts and traffic lights. Traffic calming techniques, however aim not only to reduce the vehicle speeds but to create an environment conducive to calm traffic. Traffic calming can be used as part of a total philosophy aiming at the reduction in the overall need for car travel. Such a philosophy could involve the development of land use patterns focussed on public transport, walking and cycling and giving priority to these modes wherever possible.

Newman and Kenworthy discuss several unifying themes of traffic calming identifying its role in turning the ownership of the street back to the pedestrian, bicyclist, public transport and the community whilst allowing all modes of transport (including cars) to share the same space in a safe manner. In an attempt to combat the traffic generation approach of the past (and in some locations, the present), traffic calming, they suggest, aims to limit motor vehicle growth and determine policies in land use and

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16 Newman and Kenworthy 1992 p12
17 Newman and Kenworthy 1992 p12
18 Tanghe, Vlaeminck and Berghoef 1984
19 Newman and Kenworthy 1992 pp13 -1 4
transport patterns that minimise the need for more facilities for the car.

It is through traffic calming that each street can really physically reflect its traffic and community function. Within suburban areas traffic calming policies can be used to enhance the residential nature of the street to ensure that the driver is totally appreciative of his surroundings both in a physical and social sense.

Such objectives can be achieved through a combination of the following measures:

(a) A reduction in traffic speed;

(b) The reallocation of carriageway space to non-traffic activities;

(c) The redesign and enhancement of the street environment.

As discussed previously, the majority of Australians are familiar with those traffic calming techniques aimed at reducing traffic speeds. The installation of street humps, roundabouts and pedestrian crossings are common practice within the residential areas of Australia. Such methods, however, have little affect on the general amenity of these areas as they do not incorporate improvements to services for alternative transport modes. Additionally, the effectiveness of these methods at slowing traffic is regularly questioned - in many situations they are installed as a cheap and fast fix to the perceived problem, but fail to provide a deterrent to unwanted traffic. In situations where these methods are implemented as the sole means of traffic calming the problem can be altered from one of traffic speed to one of restricted traffic flow and visual degradation. To ensure traffic calming objectives can be fully met traffic controllers must incorporate speed reduction measures with supporting environmental and safety measures. Such measures, a number of which are described in Table 2.1, have a lesser impact upon the speed of the vehicle but rather add to the visual character of the street and improve the safety of the street for persons not using motorised transport.

2.5 Implementation

Unless these speed reduction and environmental and safety measures are imposed upon a street or suburb in accordance with each street’s function in the regional system their positive affect will be minimal. Traffic controllers in the past have tended to introduce measures purely as a means of improving a street’s traffic movement function. With the awareness of a functional classification system, existing traffic calming measures can be combined with suburban land use policies to alter the role of the suburban streets in a manner that will best benefit the area through which it passes.

(a) Functional Classification Systems

The introduction of traffic calming measures is often successful in reducing traffic volumes in a targeted street by relocating it to a non-targeted area. To ensure the intended improvements are met, traffic calming policies must be based upon a regional street classification system. This classification should be used to determine the appropriate characteristics of a street, its surrounding areas and the traffic utilising it

The current method of street classification is based upon vehicle carrying capacities. This method is used to determine the standard of formation, the number of lanes, the types of gutters/footpaths

20 Brindle 1979 pp14 - 15
<table>
<thead>
<tr>
<th>Environmental and Safety Measure</th>
<th>Space Reallocation for Other Uses</th>
<th>Visual Enhancement of Street Scene</th>
<th>Local Streets</th>
<th>Collector Streets</th>
<th>Mixed Priority Streets</th>
<th>Traffic Priority Streets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical Width</td>
<td>No</td>
<td>Yes</td>
<td>Suitable</td>
<td>Suitable</td>
<td>Suitable</td>
<td>Possible</td>
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<tr>
<td>Narrow Carriageways</td>
<td>Yes</td>
<td>Yes</td>
<td>Suitable</td>
<td>Suitable</td>
<td>Suitable</td>
<td>Possible</td>
</tr>
<tr>
<td>Occasional Strips</td>
<td>Yes</td>
<td>Yes</td>
<td>Not recommended</td>
<td>Possible</td>
<td>Suitable</td>
<td>Possible</td>
</tr>
<tr>
<td>Surface Changes - type/colour</td>
<td>No</td>
<td>Yes</td>
<td>Suitable</td>
<td>Suitable</td>
<td>Possible</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Entrances and Gateways</td>
<td>No</td>
<td>Yes</td>
<td>Suitable</td>
<td>Suitable</td>
<td>Possible</td>
<td>Possible</td>
</tr>
<tr>
<td>Central Islands</td>
<td>Yes</td>
<td>Yes</td>
<td>Not recommended</td>
<td>Possible</td>
<td>Suitable</td>
<td>Possible</td>
</tr>
<tr>
<td>Shared Surfaces</td>
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<td>Yes</td>
<td>Suitable</td>
<td>Not recommended</td>
<td>Not recommended</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Footway Extensions</td>
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<td>Yes</td>
<td>Suitable</td>
<td>Suitable</td>
<td>Suitable</td>
<td>Possible</td>
</tr>
<tr>
<td>Planting/Greenery</td>
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<td>Yes</td>
<td>Suitable</td>
<td>Suitable</td>
<td>Suitable</td>
<td>Suitable</td>
</tr>
<tr>
<td>Street Furniture and Lighting</td>
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<td>Yes</td>
<td>Suitable</td>
<td>Suitable</td>
<td>Suitable</td>
<td>Suitable</td>
</tr>
</tbody>
</table>

Source: Devon County Council 1991
provided and the priority of traffic in each street. Unfortunately this method pays little or no respect to the communities through which the street travels. An alternative approach formulated upon the aims and objectives of traffic calming must be concerned with a re-classification of streets based upon their social and community function and sensitivity together with their traffic function. In this way streets could be dealt with not purely as channels for private vehicles but can be considered in light of the type of traffic they are expected to carry, the areas through which they travel and can be related to land use and environmental objectives for the area. Such a means of classification determines:

(a) The priority of one street over another when installing control devices;
(b) The location of important traffic generating land uses;
(c) The degree of constraint that can be exerted on traffic to improve an areas amenity;
(d) The priority of one form of transport over another.

Once a classification has been determined it should be possible to formulate ideal routes of travel for the various forms of transport

(a) walking
(b) cycling
(c) public transport
(d) private motorised transport

and to use this formulation to document the work required to best service these routes in a manner which encourages individuals outside and within the community to regain their understanding and appreciation of suburban street.

2.6

Community Involvement

In their discussions of traffic calming Newman and Kenworthy highlight the importance of community consultation. They suggest that only those involved in the day to day running of a suburb can have a real understanding of the types of social exchanges that occur, the lifestyle that is led and the function of the various elements of that suburb. Involvement from the community, they suggest can provide a platform for a fight for more sustainable solutions to traffic problems. To facilitate a traffic calming process/plan the community needs to be involved at two stages - both at the establishment of direction and once designs and programs have been considered.

21 Devon County Council 1991 p 13
22 Brindle 1979 p.15
23 Newman and Kenworthy 1992 p17
Chapter 3

Planning for Alternative Forms of Transport
Chapter 3
Planning for Alternative Forms of Transport

3.1 The Green Modes

The provisions of services for the car in the twentieth century western city has dominated its form and its culture. As discussed in Chapter 2, car usage and transport patterns are contrary to sustainable development policies. Within the concept of a total transport philosophy discussed in that Chapter, sustainable development patterns must incorporate the provision of services for modes of transport other than the private motor car. That is:

(a) public transport - bus, rail, taxi;
(b) cycling;
(c) walking.

These "green modes" could play an important role in developing a sustainable culture. Should provision of services for these modes reduce the need for the private motor vehicle? Not necessarily - variations from an ingrained pattern of behaviour must be encouraged through the use of practical and attractive alternatives.

Practicalities

In his paper, Balancing Transportation, Hirten discusses the effectiveness of providing for the bicyclist:

"In order for a bikeway to succeed in encouraging high levels of use it must be a system and go somewhere. The system must be area-wide and offer continuity."

This comment could equally refer to all "green modes". Planning for all forms of transport should occur on a regional basis in conjunction with land use policies and plans to enable access to all forms of "person attractors" whether they be commercial centres, institutions, the local shop or the residential neighbourhood.

Engwicht argues that:

"No resident should be denied access to community and public facilities simply because of economic or social status, age, sex or physical condition. In many cities the physical arrangement of road and facilities is such that only those who have cars have access."

Unless "green mode" services are closely associated with the needs of those utilising them (most notably in their destinations) they will not present a practical alternative to the motor car.

(a) Attractiveness

Engwicht discusses the power offered to the driver of a private car affording a domination of space and time.

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24 Engwicht 1992 p 133
When in control of a car, an individual's "zone of influence" is substantially greater than if he were a passenger in a bus, a bicyclist on the street edge or a pedestrian on a footpath (when he would normally stand on an equal footing with the rest of humanity). This power over space and time also allows a driver an anonymity unachievable in other modes of transport. The physical barrier and speed of movement allowed by the vehicle provides for actions of confrontation not considered by the pedestrian or bicyclist. To be placed on the receiving end of the power domination - whether as a passenger waiting for, or travelling on, a bus/train, a bicyclist sharing the formation, or a pedestrian travelling immediately beside the formation - places an individual in an unattractive situation. This lack of attractiveness can only be improved through more careful and thoughtful planning for these modes of transport.

3.2 Public Transport

Peter Newman describes four forms of the city:

(a) The Traditional City - up to 1850 in Europe (Figure 3.1)
(b) The Transit City - 1850 - 1940 industrial world (Figure 3.2);
(c) The Automobile City - 1950 till present (Australia and USA) (Figure 3.3);
(d) The Future City;

Suggesting that the formulation of the Future City will involve retrieving some of the original character of the Walking and Transit Cities for plantation into the Automobile City. The difficulty with this aim is not only the influence of the car but of the urban form of, especially Australian, cities formulated by the industrial period.

Transit Cities focussed upon the city centre providing a network of service "spokes" originating from the central space of the Walking City. These "spokes" attracted development along their path with specific nodes forming at rail stations/tram stops. Their main purpose was the mass movement of persons from the suburb to the city for work. As cities grew the areas between these spokes developed, serviced by buses and an increasing number of private cars. The fixed route of rail and tram, however, afforded little flexibility in destination and therefore began to lose its appeal. Private transport, alternatively, was able to cater for the diverse demands placed upon an individual.

For public transport to regain its importance therefore the service it provides must be more flexible, more appropriately designed for the needs of the people.

Wildermuth describes the required ingredients of a public transport oriented city:

(a) Attractive and user friendly Public transport hardware eg. vehicles, stations, shelters, ticketing equipment;
(b) Public Transport "Software" designed to be easily understood by

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29 It should be noted that discussions on Public Transport in this Study have purposefully excluded the Taxicab. Taxi companies are generally relatively small operations operating on a low capital base, with high overheads. Fares charged by these companies are high, often outside the budgets of University patrons. In addition their lack of formal route systems allows little scope for useful intervention.

30 Newman 1993 p 1

31 Wildermuth 1993
Figure 3.1
The Traditional Walking City

- High Density
- Mixed Use
- Organic Structure

Source: Newman 1993
Figure 3.2
The Transit City

* Medium Density
* Mixed Use
* Grid Based
* Centralised

Source: Newman 1993
Figure 3.3
The Automobile City

* Low Density
* Separated Uses
* Arterial Grid and Cul de sac base
* Decentralised

Source: Newman 1993
existing and potential passengers and available at the right place at the right time eg. route information, fare and ticketing information, marketing campaigns;

(c) **Urban Transport and Parking Policies** which recognise the large social, economic and environmental costs of excessive car usage;

(d) An existing urban density which generates a base demand for public transport sufficient to justify a high level of service on the line-haul routes, together with a **Regional Land Use Policy** in sympathy with the defined role of public transport, including intensive development around public transport modes.

To simplify, he suggests that a successful public transport system must be legible, attractive, accessible whilst being supported by 'anti - car dominance' policies, a sustaining urban density and land use policies centred upon the abilities of public transport.

(a) **Legibility, Attractiveness and Accessibility**

To distinguish themselves from individual traffic movements, public transport systems (transit systems) must be seen to be a coordinated group of vehicles, and if applicable, modes of transport, working towards a common goal. The system must physically identify itself through the establishment of colour schemes, logos and style of services to ensure that even the most infrequent of patrons have no trouble using and identifying the service. A lack of such coordination can lead to confusion on behalf of visitors and less frequent patrons as to which services to catch at which location.

Services (including stations, bus stops, vehicles) must not only be easily identifiable in their design but must provide an attractive alternative to the private vehicle in relation to speed, reliability, comfort and cost. In this regard the drawing of patrons from owners of luxury vehicles is a big demand on the standard of service of the systems.

Access to public transport (and by extrapolation from public transport) is the main factor currently limiting the popularity of transit systems within some Australian cities (for example, Brisbane, Sydney and Hobart). In fact Ian Cooper in his paper "Urban transit in the Eighties and Beyond" suggests that in outer suburban areas in all Australian cities public transport is irrelevant to most residents because it is not convenient:

"Why is it not convenient? The planners have sprinkled buildings of all shapes and sizes all over suburbs with absolutely no thought given to how the hapless person with no car or the unfortunate teenager not old enough to hold a licence gets to these places. The bus if it is provided usually has to undertake a tortuous journey many times longer than the equivalent car journey."

The difficulty lies in designing a system which is relevant to all who wish to partake of its services - from the commuter who wishes to make the total journey as short as possible, through the tourist who wishes to see "unique" locations to those less mobile with more time for whom door to door service is more important. Transport route, timetables and services should correlate to the location of and diversity of land uses to obtain a balance between directness and convenience.

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32 Transit Australia Nov.1988 p 227
33 Cooper in Transit Australia Feb.1990 p.35
(b) Anti-car Dominance Policies

Such policies include concepts such as traffic calming as discussed in Chapter 2 as well as economic incentives for public transport patronage, including low fares, tax rebates, as well as disincentives for private vehicle usage (petrol levies, road tolls). These economical issues although central to the success of any coordinated public transport system are outside the scope of this project and will not therefore be discussed in detail.

(c) Urban Density

For any transit system to be economically successful it must receive a good rate of return from the farebox when compared with the overall distance travelled - accordingly higher urban densities should bring better rates of return by providing an opportunity for greater patronage in lesser distances. Newman and Kenworthy\(^{34}\) describe an exponential relationship between the use of public transport and urban density (Figure 3.4):

"cities with higher urban densities tend to use public transport more and private cars less" \(^{35}\).

The possibly limited level of service provided by a system (in terms of route locations) calls for a maximisation of persons within walking distance of stations/stops. In fact Newman\(^{36}\) nominates a critical density of 30 persons per hectare for a significant reduction in car use. In practice, however, does the increase in density promote the use of these public systems or does the introduction of coordinated public systems promote high urban densities? The interrelationship between these factors is such that both statements are true.

\(^{34}\) Newman and Kenworthy 1989 Fig 9(a)
\(^{35}\) Ellison 1993 p 10
\(^{36}\) Newman 1993 p 2

(d) Land Use Policies

The implementation of land use policies that encourages a mixture of land uses at access points to the transit system concentrates employment in locations easily accessible by public modes and, if the transit system is well implemented, ensures the economic viability of those businesses- creating a means of pulling the resident to the public system whilst allowing the patron ease of access to commercial, industrial and health services etc.

So what method of provision is more applicable to the future Australian City in terms of viability, accessibility and practicalities?

For the purpose of this paper the author intends to discuss the role of heavy and light rail (including trams), and bus systems.

3.3

Heavy Rail

All major Australian Cities, saving Darwin and Canberra have been serviced by metropolitan rail systems. (Darwin because it has never been large enough to warrant the capital input, Canberra because it was planned for the car and not fixed route transport). The importance of this mode of transport in the total transport system differed from city to city. The relative size of Hobart, Perth and Adelaide was such that suburban heavy rail was concentrated on main service lines to and from ports and industrial areas - these routes were used to a limited extent to provide a service to those residential areas through which they passed. The past 15 years have brought significant changes in this regard. Passenger rail in Hobart has been abandoned due to lack of patronage.
FIGURE 3.4
AFFECT OF URBAN DENSITY
UPON PUBLIC TRANSPORT
USAGE

Source: Newman, 1993
and capital costs, whilst in Perth it is being substantially upgraded and extended in appreciation of the significant population increases in that city in the last 30 years.

Heavy rail in the three major cities (Brisbane, Melbourne and Sydney) has always been and continues to be a significant player in these cities' transit systems. The routes in these cities, as discussed previously were the initial determinants of development patterns at the end of the nineteenth and beginning of the twentieth centuries. The lack of any major cross routes in these radial systems has always and continues to limit heavy rail's service levels within residential between the radial lines.

Heavy rail is substantially limited in its route pattern. The mode demands its own right-of-way totally separate from the street system (being too heavy to travel over conventional street surfaces) thereby requiring substantial swaves of land. The character of these machines is such that they cannot climb steep slopes or turn sharp corners at average speeds - necessitating the provision of routes that minimise sharp inclines, declines and corners.

Adoption of a heavy rail system into a city unprepared for such development would therefore not feasible. The fabric of non-rail cities is such that unless previously reserved for such a purpose, the requirements of heavy rail routes could not be accommodated.

3.4

Light Rail (Tram)

The concept of light rail (shorter, lighter, faster, more adaptable than heavy rail as well as being powered electrically) was adopted in most Australian cities from their very beginnings in the form of trams. This mode could be adapted from the need for a separate right-of-way to travel the streets amongst the cars and buses - thereby providing a more economical use of land. It was this ability to share space with private vehicles that ironically brought about the demise of trams in Adelaide, Sydney and Hobart - the gradual increase in car ownership placed a greater demand on space for the car (as more families bought their own cars, less persons needed to use the tram systems but more people wanted to use the streets). Brisbane followed suit in the 1960's following the destruction of a large percentage of its fleet in a major depot fire. This left only Melbourne.

Trams in Melbourne have always been and continue to be a major part of that city's urban identity. The extensive system is closely coordinated with the heavy rail system in the inner/middle suburbs, unfortunately however it has not been feasible to extend these lines into the newer outer suburbs.

Light Rail (in the form of modernised double length trams) has been the subject of transit studies in every capital city in the last five years, save Darwin. All studies have involved the comparison of light rail with heavy rail and/or buses. Although it is unclear at this stage what will be implemented, most studies favoured the introduction of light rail.

Melbourne is the only city in Australia to have introduced modern light rail into its system - providing lines through the city centre from East Brunswick to St Kilda and to Port Melbourne. The vehicles operate on a converted heavy rail reserve, special medium strip road reserves, and on

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37 Transit Australia 9/91, 2/92,3/92 and 4/92
38 Network 1/88 p 24
carriageways. The addition of this mode, suggests Network Journal, has made Melbourne’s tram network the largest in the western world.

(a) **The Advantages of Light Rail**

Light Rail is an electrified system supported by overhead wires. This method of power supply is not only more environmentally sustainable than petrol or diesel but, together with the rail lines, provides a system presence. This presence allows easy identification of transport routes, locations and services. In addition, the electrified system minimises the noise and air pollution emitted by the vehicles. The design of the vehicles and the route characteristics allow light rail to travel faster than buses whilst accommodating a larger number of passengers in greater comfort (with lesser lateral movement).\(^{39}\)

(b) **The Disadvantages of Light Rail**

As with heavy rail, light rail requires separate space to the car - whether this be designated street space or separate rights-of-way. This may be possible in larger cities where road reserves or rail reserves are wide and accessible enough to accommodate them - otherwise it may be difficult. In the smaller cities such as Hobart, the practicalities of introducing these vehicles amongst cars whilst giving no further disincentives to private travel, would create chaos on already crowded streets. The significant costs of developing services for such a mode demands a high rate of return from the patrons, and therefore a high urban density - in the larger Australian cities this may be feasible.

Although considered flexible, light rail cannot deal with significant slopes and bends, again providing a limitation on its possible route locations.

3.5

**Buses**

(a) **The Advantages of Bus Services**

Of the major transit modes buses are the most flexible. Buses can travel the street system in company with private vehicles and are not restricted by sharp changes in direction and slope. The lack of necessity for any permanent structures (saving shelters and bus stops) minimises the capital costs of such a service when compared to fixed route transit. Although the use of diesel (as compared with electricity) can impose substantial economic and environmental costs, lower overall maintenance costs allow buses to service more diverse urban densities in a more direct manner than rail.

(b) **The Disadvantages of Bus Services**

The lack of any large scale permanent structures associated with bus services robs the mode of any system presence; effectively allowing the buses to 'hide' amongst the private and service vehicles. Such systems must concentrate upon legibility as discussed in Part 3.2.

Although in the major cities such as Sydney and Melbourne an attempt has been made to correlate the bus system with the fixed modes - thus allowing buses to be feeders to the central rail system, allowing cross-city links between strong rail nodes\(^{40}\) - in smaller cities such as Adelaide and Hobart the bus system (being the central transit mode) is centred on the Central Business District, allowing little if

\(^{39}\) New Zealand Railways in Transit Australia 11/90 p245

\(^{40}\) Newman and Kenworthy 1994 p142
any cross-travel between suburban areas and the outer commercial areas. These routes disregard major traffic generators such as tertiary education centres and the majority of commercial industrial areas, and accordingly do not provide an attractive alternative to the private vehicle.

**Non-motorised Transport**

"The goal of good bikeway (and pedestrian) planning and design should be to take a bicyclist (or pedestrian) from where he is to where he wants to go in the safest, most direct, feasible route and in pleasant surroundings." 41

Engwicht’s comments regarding the power given to an individual when behind the wheel of a car exemplifies problems encountered by pedestrians and bicyclists. As discussed, the ability to exert power over others is diminished to human levels in such modes. Accordingly an individual’s ability to defend itself is dependant upon confrontation with people in similar circumstances (other pedestrians and bicyclists). This ability is lost if confronted with motorised transport. It would seem logical therefore to conclude that planning for the bicyclist and pedestrian should minimise points of confrontation with the car. Is this currently the case?

The dominance of the car in the design of suburbs and the streets within those suburbs effectively "decreases walking and cycling space by either taking it over for roads or allowing it to fall into traffic’s zone-of-influence." 42 The people most affected by this pattern of development are those with no access to private car 43 (poor, handicapped, children, elderly) who have no option of driving when walking or cycling becomes impossible or too dangerous. Such patterns concentrate on the width and standard of street formation with little consideration given to the standard of services provided in the reservation on either side — accordingly in many areas an ‘acceptable’ standard has been the provision of 1 - 1.5m footpaths separated from the formation by a gutter and a 0.5m grass nature strip - the physical attractiveness of such provisions for the pedestrian is questionable, the visual attractiveness for the suburb very limited.

As for the bicyclist. In most Australian states the bicycle is legislatively defined as a ‘vehicle’ and is prohibited for use on footpaths - accordingly unless separately catered for through the provision of bicyclepaths, bicycleracks or bicyclelanes, bicycles must share the street formation with the remainder of ‘vehicles’ - one must ask who is in more danger, the pedestrian sharing the footpath with the bicyclist or the bicyclist sharing with motorised transport?

This dominance of the car in Australian suburban planning has meant historically that pedestrian and bicycle routes have been determined by the street system. These systems often favour the motorised vehicles a result of steep slopes, poorly lit areas, frequent intersections, one-way systems. As often the need for speed of journey is as applicable for non-motorised transport as motorised, it can be seen that the more frequently utilised routes are on those streets which carry the most traffic, thereby creating an even less attractive scenario for these modes. Catering for the

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41 Huffman 1974 p.655
42 Engwicht 1992 p.101
43 14.6% of households in Hobart were carless in 1986 - Kennedy, Wood, Cotgrove 1986. p. 28
'non-car owner' should occur in a manner which allows those people to visit the locations they wish in a safe and attractive manner in a way that encourages current car users to use these modes at least occasionally. How should this be done?

It must be acknowledged that planning for the bicycle lost favour in the 1950's and 60's when the private ownership of motorised vehicles reached its peak rate of growth. Although the bicycle retained a level of popularity with children, it was not until the introduction of more lightweight and multi-gear vehicles that their popularity with adults was renewed. These bicycles were easier to ride especially up hills. Accordingly the bicycle again became an option for adult transportation.

The difficulty of planning for the pedestrian and bicyclist stems from the variety of categories of users of these modes. For example, a large proportion of people who currently cycle do so for fitness and recreation. The needs of these people differ from those travelling to work, shops or school by bicycle - directness of route is less important if replaced with one of scenic and locational interest. The situation for the pedestrian is similar, differing in one point of significance - from the personal observations of the author, walking is used more frequently for short distance trips where in the time spent reversing the car out of the garage or fetching the bicycle out of the shed, the trip can be completed on foot - the attractiveness and safety for the pedestrian in such circumstances cannot be overlooked as insignificant.

Planning for the recreational walker, jogger or bicyclist is significant for the retrieval of communal ownership and appreciation, however, it is the other categories of users - the commuters that are more relevant to the sustainability debate.

Planning for pedestrian and bicycle journeys must concentrate on land use patterns. As is the case for all alternative transport modes these journeys are focused upon major land uses - business, commercial and recreational centres.

Access to these areas should be as direct as possible - in many cases this will mean utilisation of the existing street system but frequently the opportunity is available to provide access between streets through the centre of suburban blocks in a safer more pleasant manner.

Clearly the opportunities of planning for these modes depends upon the stage of development of a suburb. The role such a concept can have in the implementation of new subdivision is significantly greater than that within established suburban areas.

(a) What opportunities are available?

The classification of bicycles as vehicles within most Australian states is both disadvantageous (from a safety aspect) and advantageous. Such a classification widens the available locational opportunities allowing for both on and off-carriageway routes. Pedestrians however, are confined to any available off-carriageway locations.

The variety of possible facilities for these modes are listed and discussed in Diagram 3.1 - 3.6.

The process of determining which facilities are applicable to any study area should involve the implementation of a coordinated strategy plan for the purpose of determining:

1. location and standard of existing facilities

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44 National Association of Australian State Road Authorities 1980, p.2
45 The City of Hobart Cycleway Study 1984 states that 45% of cyclists do so for recreational, fitness or relaxational purposes p 56
Diagram 3.1
Current Situation
Lack of Visual/Physical Barriers

Diagram 3.2
Option 1
Landscaping

Diagram 3.3
Option 2
Provision of Separate Bicycle Lanes

Diagram 3.4
Option 3
Provision of Shared/Segregated Footway

Diagram 3.5
Option 4
Separation of Pedestrians & Bicycles

Diagram 3.6
Option 5
Provision of Street Independent Multi-Use Paths
2. Streets in the system which could safely accommodate these modes.

3. Land available for multi-use paths.

4. Potential sources of funding.

5. Regulations in force controlling the location of such services, e.g., land use regulations, traffic regulations, safety programs.

Once these requirements have been documented, Hudson\(^\text{46}\) specifies a number of characteristics which should aid in the formulation of appropriate routes:

1. Routes should be direct and connect as many starting points and destinations as possible. The lack of motorisation and the amount of effort involved in these modes necessitates direct routes.

2. Routes should be free from heavy traffic and well signposted. The motorist must be able to recognise the priority routes for safety purposes.

3. Provision should be made for safety at street junctions. These should involve minimum delay for pedestrians/bicyclists. Freewheeling Australia in their study on Geelong cycling found that 71% of all reported cycling accidents occurred at intersections with main roads. The development of safe intersections and street crossing should be given priority in preparing bicycle (and pedestrian) plans.\(^\text{47}\)

4. Routes should not involve unnecessary hill climbing. Bicycles are at their best on flat streets where they require little effort compared to walking. Moderate grades can be ridden (and walked) relatively comfortably, however, walking and cycling up steep hills can be hard work and are not welcome at the end of the day.\(^\text{48}\)

5. Routes should be well surfaced. Walking and cycling on rough surfaces is uncomfortable and often hazardous.

6. Bicycle parking facilities should be provided at all major destinations. Bicycle parking facilities must be provided for the convenience of bicyclists to order the parking of bicycles and ensure that the convenience of pedestrians and other street users is not impeded. It is claimed that the lack of parking facilities for bicyclists deters the use of the bicycle.\(^\text{49}\)

7. Routes should be visually attractive.

8. Routes should provide frequent and adequate shelter.

(b) The Advantages of Non-Motorised Transport

The benefits of walking and cycling are probably best described in point form:

(a) Either mode is available to most people dependent upon age and disability;

(b) Neither mode is polluting, creating no exhaust, almost no noise and no detrimental visual affects;

(c) Both modes offer door to door mobility;

\(^{46}\) Hudson 1978, p.68
\(^{47}\) City of Hobart 1984, p.26
\(^{48}\) City of Hobart 1984, p.15
\(^{49}\) Geelong City Council 1980, p.5
(d) cycling poses only minor risks to other street users;

(e) both modes provide health benefits;

(f) neither mode places high demands upon urban space for transport or parking;

(c) The Disadvantages of Non-Motorised Transport

Both bicyclists and pedestrians are highly susceptible to the weather. Not only does the wind and rain make movement unpleasant but such circumstances can create dangerous situations due to poor visibility, and the susceptibility of lightweight bicycles.

The self powered modes are greatly deterred by steep hills. Physical effort involved in climbing these slopes can make the journey tiring and uncomfortable.

The carrying capacity of a bicycle or a pedestrian greatly limits their usefulness for shopping and transportation of goods (eg books and documents).
Chapter 4

Case study - The University of Tasmania
Chapter 4

Case Study - The University of Tasmania

4.1 Historical Development

The University of Tasmania was established on the Queens Domain in the Hobart Central Business District in 1892. Economic constraints imposed by the State Government, and physical constraints imposed by the public location of this site meant that the University soon outgrew this site - by the 1920's it was considered insufficient for the University's needs. As physical expansion into the public Domain was ruled out by the State Government, the University's only option was to relocate. Alternative sites in New Town, and Government House were mooted. Although controversy exists over the initial suggestion of the Sandy Bay Rifle Range it would seem that original discussion in this regard can be traced back to the early 1920's. Residents in suburbs surrounding the Range had been complaining about the dangers of spraying bullets, initiating interest from both the Hobart City Council and Developers to develop the site for residential purposes. The University Council, however, saw the site as an opportunity for substantial future growth. Release of the land from Commonwealth ownership was delayed because of political incompatibilities between the State and Federal Government. It was not until 1939 that a formal request was made to the Commonwealth Government using a national fitness campaign as a means of obtaining better University sporting facilities. This request was approved in that year, but it was not until 1944 that the transfer was gazetted.

The move to the new site occurred very gradually over a period of twelve years from 1946 - 1958. Land on either side of the title had been extensively subdivided 50 to 60 years before the relocation. Physical growth was therefore limited from the very beginning to the original title boundaries. At the time of initial relocation the Campus was served by only one through street - Sandy Bay Road. This primary road running along the eastern boundary of the site carried the extensive public tram system as well as private vehicles, and as such served as the major access route to the Campus. The alternative route, Regent Street, ran to the northern boundary of the site approximately 800 metres west of Sandy Bay Road. Although no tram route was provided along this access, private vehicular access was convenient to the main areas of Campus.

Initial development of the site was based upon a Master Plan devised by Professor Leslie Wilkinson (Professor of architecture at Sydney University) in his report commissioned by the University of July 1944. The plan featured a strong west-east axis with faculty buildings aligned either side of a central space. At the head of this space sat a "Great Hall", the focus of layout. The central space catered for playing fields and parking areas (Figure 4.1)

50 Davis 1990, p.103

51 Davis 1990, p.104
The top picture shows the front view of the proposed Great Hall, which will dominate the site of the new university. The plan shows the proposed development of the university site. The street shown in the top right corner is the extension of French St. planned to cross the arm. The street joining X and X is shown below the Great Hall. The site marked X is a site suggested for a possible hospital and X a possible medical school. The key to other features is: 1. engineering; 2. chemistry; 3. geology; 4. physics; 5. library; 6. Great Hall; 7. union buildings; 8. arts; 9. agriculture; 10. co-op; 11. botany; 12. hall of residence; 13. tennis court; 14. basketball court. Behind the university will be sites for colleges and staff houses.

85. Mercury report of 22 June 1954, on the planned first stage at Sandy Bay. The proposed Great Hall in this design never eventuated.
Although faculty buildings were gradually constructed generally in accordance with the Master Plan, lack of funds restricted the speed of development resulting in the involvement of virtually a different Architect for each building - only the engineering building was designed by Wilkinson. In addition, plans for the Great Hall were considered outdated and impractical and were abandoned in 1969. The Hall was replaced by a multi-purpose University Centre in 1976 - its totally function oriented architecture failing to effectively gather the surrounding buildings into the intended enclave (Figure 4.2).

Both through the choice of site and Master Plan the University failed to appreciate the extent of long term expansion (Wilkinson planning for a maximum of 1000 students) as well as the impact of transport routes and parking on the availability of land and development guidelines for the Campus.

As the University grew in patron numbers the pressure on the provision of land for carparking and construction purposes rose. The character of the Campus site is such that the gradients vary greatly from 1° towards the eastern boundary to approximately 24° in some of the gullies towards the centre of the title. Initial development occurred on the flatter areas (4° - 7°). By pure misfortune these areas of the title were in the narrow section of the wedge, and were, therefore very limited in area. Following the initial development of the faculty buildings in accordance with the establishment of sports grounds, roads and limited areas of parking to supplement these facilities, the University was faced with a limitation on the scale and form of development. The presence of residential development immediately to the north and south restricted physical expansion of the Campus in these directions. The only option available was expansion westwards into the steeper terrain.

The extension of Regent Street in 1958 between Alexander Streets and Nelson Road dissected the University Title. This extension, to be known as Churchill Avenue, opened an opportunity for subdivision of the higher slopes of Sandy Bay. Extensive subdivision in these areas greatly increased traffic along Regent Street, and by extension through the Campus. This street separated the Student Union and Hytten Hall, built in 1959, from the main faculty buildings and isolated the upper/steeper section of the site from the lower/flatter areas. As the upper area was developed for Residential Colleges, Medicine, Life Sciences and Agriculture little thought was given to how these facilities would be connected to those on the lower side and in what way they could be expanded in the future. Carparking and streets used to service these buildings used a large area of more accessible (flatter) land.

Development in the late 1980's and early 1990's has been extended further up the hill from Churchill Avenue increasing distances between faculties, and therefore travel times. The historical development of the site is depicted in Diagram 4.2.

4.2

The Problems

The historical development of the Campus has provided the opportunity and atmosphere for the emergence of a number of environmental and social problems central to the sustainability debate. These problems create issues that centre upon the maintenance of suburban life, the thoughtful provision for modes of travel, the reduction in the use of the private
Figure 4.2
University Centre
vehicle and the establishment of land use policies particular to an area's needs.

To simplify the nature of the problems it is best to separate them into those of an on- and off-campus nature. The author acknowledges, however, that in practical terms the two situations should not be divorced, as one must be fully appreciative of the other in order to develop in a sustainable form.

4.2.1

On - Campus

(a) Provision of services for the private car

Parking Form

Parking areas on campus have been inappropriately located and developed in an inefficient form.

Map 4.1 shows the location of existing on-campus parking.

The parking areas are all open air surface parking. This design requires a substantial area of land for its provision. From a practical and economical viewpoint the development of parking on steep slopes is impractical, accordingly on-campus provision has been made on the flatter areas of campus restricting the area of land available for building development. This use of land is inefficient and environmentally degrading, forcing the 'premature' development of the steeper slopes of the title. These areas lie westwards of the recently constructed CSIRO Building and the Residential Colleges, up the gully between Mount Nelson and Tolmans Hill. The "stretching" of the campus to these locations places great distances between demand centres, thereby indirectly forcing patrons to relocate their vehicles around the campus during the working day to locations that best service their point of destination.

Initial development on campus in accordance with the Master Plan allowed for the establishment of parking areas in that corridor eventually dissected by Churchill Avenue (Figure 4.1). These areas eventually developed as the main carpark, and the 'service area' carpark. The growth of the University, however, gradually demanded the provision of additional areas: Dobson Road and Grosvenor Crescent were developed as a connecting circular route external to the faculty buildings, with parking provided directly off these streets both parallel to and at 90 degrees to the formation. To reflect this earlier form of provision most parking since has followed this form.

Parking Numbers

The City of Hobart Planning Scheme defines Parking Standards for any development within the City in Part E.4. It identifies a required number of parking spaces for each use group defined in its Zones and Use Group Table. The Group most relevant to the Campus site is Use Group VII - University or Tertiary Institutions - specifies a requirement of:

1 space per 2 staff members

+ 1 space per 10 students

By this calculation, the Campus should currently provide at least 1234 spaces. In fact provision is made on campus for 1267 spaces to accommodate the demands of 7800 persons - this is therefore in excess of the requirement.

Although it is not possible, as part of this study, to determine what proportion of University patrons use private vehicles for
access to the Campus, statistics\textsuperscript{52} suggest that approximately 64\% (4,990) of these patrons own a vehicle. In fact, Campus surveys\textsuperscript{53} have shown that up to 80\% of staff and 50\% of students drive a vehicle to Campus - this would equivocate to 54\% of patrons. On these numbers, Campus parking provides for under one third of patrons driving to University.

Supply is provided in a variety of classifications. Table 4.1 defines the different classes and the relative number of spaces provided.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unclassified</td>
<td>330</td>
</tr>
<tr>
<td>Non Permit</td>
<td>292</td>
</tr>
<tr>
<td>Permit</td>
<td>444</td>
</tr>
<tr>
<td>Reserved</td>
<td>69\textsuperscript{54}</td>
</tr>
<tr>
<td>Voucher</td>
<td>103</td>
</tr>
<tr>
<td>Short Term</td>
<td>16</td>
</tr>
<tr>
<td>Disabled</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,267\textsuperscript{55}</strong></td>
</tr>
</tbody>
</table>

The layout of these classes is shown on Map 4.1.

\textsuperscript{52} Australian Bureau of Statistics 1994 Fig. 23.7
\textsuperscript{53} Jackson Teece Chesterman Willis & Graham 1994, p.28
\textsuperscript{54} Reserved parking spaces are provided by the University to accommodate the needs of the Vice Chancellor, Deputy Vice Chancellor, Financial Director etc., as well as Heads of Staff, and Staff that frequent other University buildings around the City and must be assured of gaining a parking space near to their place of work.
\textsuperscript{55} Jackson, Teece, Chesterman, Willis & Graham 1994, p.27

The Campus system allows for the purchase, by Staff of Parking Permits. These permits are issued upon the payment of an annual fee of $25.00 - allowing purchasers the opportunity of parking in the designated permit spaces. The University provides Permits at a ratio of 2:1 to the permit spaces provided. This effectively allows the opportunity for all staff to purchase one. It can be seen therefore that non-permit holders have direct access to 741 spaces whilst permit holders can use both the permit spaces, non-permit spaces, unclassified, voucher and short term spaces, totalling 1,85 of the total 1,267 spaces. With only 50\% of staff being assured of a permit space competition arises in the acquisition of a space in non-permit areas between permit and non-permit holders.

A total demand of spaces in accordance with Campus surveys would suggest the Campus is deficient by 2,974 spaces. Accommodation of these spaces on campus would mean either:

(a) Development of steep slopes in central sections of the title between CSIRO and the Accommodation Colleges. This would be a wasteful form of development, possibly economically and physically impossible, and would fail to meet the demands of students 70 - 80\% of which mainly use services below Churchill Avenue\textsuperscript{56};

(b) Provision of parking areas below Churchill Avenue using existing sporting fields, or;

(c) Varying the form of provision to accommodate larger numbers in lesser area, for example subterranean or multi-level.

\textsuperscript{56} University of Tasmania 1992 Table 2.03
It must be noted, however that the perceived demand is not constant. The nature of tertiary education systems is an erratic timetable of classes concentrated between 9.00am and 1.00pm Monday to Wednesday, for 28 weeks of the year. At these times it can be anticipated that 90-100% of patrons are on campus. The form of parking provided on campus therefore has meant that large areas of land have been designated to the car to service a demand that is far from constant. Surveys carried out by the University of Tasmania\(^{57}\) confirm that during peak hours on-campus spaces are fully utilised whilst outside of these periods (especially towards the end of each week) there are always vacant spaces on campus.

### On-Campus Street Network

As previously described, the campus is crossed by a number of public streets with access being provided to faculty and accommodation buildings from these streets via a number of campus streets. Map 4.2 highlights this network of streets.

A number of issues arise from the design of these streets:

(a) The location of these streets relative to the campus buildings creates danger areas for patrons moving from one service building to another (whether by car, bicycle or foot)

(b) Entrances and exits to and from campus streets and parking areas are generally substandard. Poor signage provides no distinction between local and University streets. Figures 4.3, 4.4 and 4.5 show a number of access and egress points around campus which effectively blend in with the background landscaping.

(c) Inappropriate landscaping and signage at these locations increases the risk of traffic accidents.

(c) Traffic controls in through streets do not acknowledge their surrounding environment. Although traffic is restricted to the standard urban speed of 60kmh, the nature of the street formations (gradually sloping, wide bends) encourages higher speeds. Very little signage is used to warn of crossing vehicles, pedestrians or bicyclists and speed reduction is not encouraged. Traffic on these streets clearly have priority. The section of Churchill Avenue between Nelson Road and French Street is particularly poor in this regard.

Map 4.3 and Figures 4.6 - 4.10 provide examples of locations of conflict points between through traffic, campus traffic, pedestrians, bicyclists and public transport patrons.

The section of Churchill Avenue between Nelson Road and French Street (Map 4.4) is substandard in a number of design points:

(a) The main entrance is unclearly defined surrounded by extensive landscaping.

(b) The main exit is separated from the entrance and emerges onto Churchill Avenue at a point where sight distance is poor. This exit is immediately opposite the Service carpark, and provides access problems for pedestrians wishing to cross at this point to gain access to the Main Campus area.

(c) Access to the Service carpark is provided off a service road that enters Churchill Avenue a short

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\(^{57}\) Jackson Teece, Chesterman, Willis & Graham 1994, p 28
FIGURE 4.3
ENTRANCE TO SERVICE AREA OF
CHURCHILL AVENUE

FIGURE 4.4
MAIN ENTRANCE TO CAMPUS
Figure 4.5
Entrance to Campus from Grosvenor Street
FIGURE 4.6
MAIN EXIT FROM CAMPUS

FIGURE 4.7
PEDESTRIAN CROSSING TO BUS STOP 15
FIGURE 4.8
FRENCH STREET INTERSECTION
WITH CHURCHILL AVENUE

FIGURE 4.9
PEDESTRIAN CROSSING TO UNION BUILDING AND BUS STOP 14
FIGURE 4.10
PEDESTRIAN CROSSING AT
DOBSON ROAD
The Central axis of the former Master Plan has been retained as a vehicle free environment. Pedestrian movement between Lower Campus faculty buildings is reasonably comfortable with landscaping used to define spaces and grassed areas and wooden seating provided for relaxation. The standard and attractiveness of access from this area to the outer ring streets (Dobson and Grosvenor Crescent) is varied. Figure 4.11 shows pedestrian access from the central axis to Dobson Road between the Main Library and Chemistry Building. Services in this area are of a high standard with definitive paving, seating and lighting. Other areas, however, provide only dirt or concrete paths with no lighting or furniture (Figures 4.12 and 4.13). Pedestrian usage of these areas (especially after dark) is less comfortable or attractive.

At the points of confrontation with the campus streets no warning is given to the pedestrian of possible vehicle movements (moving vehicles are often difficult to distinguish in the sea of vehicles parked on both sides of the street) and no acknowledgment is made by vehicles of pedestrian movements (for example, pedestrians crossing signs, changes in speed).

In addition to the poor standard of pedestrian accesses, persons on campus, whether travelling by foot or bicycle receive little directional signage, save a limited number of campus information signs located at sparse locations. Ease of access to campus buildings is important for new patrons and visitors. Many of the faculty buildings are un-named, and those that are, are unclear, making it difficult to locate the required service.

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58 Jackson, Teece, Chesterman, Willis & Graham 1994 p.30
Figure 4.11
WELL SERVICED PEDESTRIAN PATH
FIGURES 4.12 & 4.13
POORLY SERVICED PEDESTRIAN PATHS
(d) Residential Colleges

Statistics for the 1992 University year\(^59\) showed 38% of students were living away from home - this totalled approximately 2500 persons. The housing choices available to these students include:

(a) accommodation in one of three University Residential Colleges
(b) student union housing (at subsidised rent) in one of a number of houses around the city, or;
(c) private rental accommodation

The residential colleges (two of which are located on campus) provide beds in institution style single room accommodation for up to 400 persons.

The housing rental scheme run by the Student Union provided beds for up to 300 students in 1992.

The remaining 1800 students are left to contend with market value rentals - often being forced out of the study area because of the high property values. These people must all have some means of getting to University.

4.2.2

Off-Campus

(a) Campus Overspill

The inability of the campus to cater for the parking demands of its patrons has resulted in an overspill of parking into the neighbouring residential areas, as can be seen in Figures 4.14 - 4.18. The extent of the influence of this overspill is described by the outline of the study area. Up to 1127 spaces are available within the suburban streets of the Study Area. Table 4.2 describes the location of these parks relative to the street hierarchy as well as the utilisation of these parks.

The large number of vehicles using and parking in these residential streets has a significant impact upon the residential amenity of the suburbs surrounding the campus. People associated with the suburban areas (whether resident or residential visitor) are detrimentally affected during University hours:

(a) in their parking opportunities
(b) through increased risk of traffic accidents (pedestrian and vehicle)
(c) through increased traffic volumes in streets designed (aesthetically and physically) for residential purposes, and accordingly;
(d) experience a loss of community 'placeness' affected by vehicle dominance.

These streets typify the situation discussed by Engwicht and Newman and Kenworthy - for 28 weeks of the year they act as substantial vehicle receptacles. What makes this situation less acceptable is the lack of association of the vehicles with the suburban area in which they are parked.

Parking Surveys conducted by the Hobart City Council in relation to the intended introduction of a Residential Parking Scheme specified that although 89% of properties within the area had at least one off-street parking space, some 68% experienced parking problems during the University week.\(^60\) Figures 4.14 - 4.18 visually describe the reasons for these problems.

\(^59\) University of Tasmania 1992 Table 3.06

\(^60\) Hobart City Council. Aug 1990
FIGURE 4.16
VIEW STREET

FIGURE 4.17
ALEXANDER STREET
FIGURE 4.18
PARKING IN DESIGNATED RESIDENTIAL ZONES
<table>
<thead>
<tr>
<th>STREET</th>
<th>CATEGORY</th>
<th>VOLUME (CAKS/DM)</th>
<th>NUMBER OF PARKS</th>
<th>UTILISATION (PARKING)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandy Bay Road</td>
<td>Primary</td>
<td>20 000 +</td>
<td>No long term</td>
<td>N/A</td>
</tr>
<tr>
<td>Churchill Avenue</td>
<td>Primary</td>
<td>Not Available</td>
<td>76</td>
<td>Full 9am-1pm w/days</td>
</tr>
<tr>
<td>Regent Street</td>
<td>Primary</td>
<td>12355</td>
<td>56</td>
<td>Usage increases toward campus</td>
</tr>
<tr>
<td>Lord Street</td>
<td>Secondary</td>
<td>1500</td>
<td>139</td>
<td>Comparatively underutilised</td>
</tr>
<tr>
<td>York Street</td>
<td>Secondary</td>
<td>2302</td>
<td>235</td>
<td>Comparatively underutilised</td>
</tr>
<tr>
<td>Alexander Street</td>
<td>Secondary</td>
<td>Not available</td>
<td>114</td>
<td>85% Capacity all day, w/days</td>
</tr>
<tr>
<td>Grosvenor Street</td>
<td>Secondary</td>
<td>2807</td>
<td>62</td>
<td>Usage increases toward campus</td>
</tr>
<tr>
<td>French Street</td>
<td>Secondary</td>
<td>Not available</td>
<td>113</td>
<td>Capacity until 3pm, w/days</td>
</tr>
<tr>
<td>View Street</td>
<td>Secondary</td>
<td>Not available</td>
<td>180</td>
<td>Capacity until 3pm, w/days</td>
</tr>
<tr>
<td>Earl Street</td>
<td>Secondary</td>
<td>1500</td>
<td>53</td>
<td>Capacity until 3pm, w/days</td>
</tr>
<tr>
<td>Quorn Street</td>
<td>Tertiary</td>
<td>718</td>
<td>44</td>
<td>Capacity until 3pm, w/days</td>
</tr>
<tr>
<td>David Street</td>
<td>Tertiary</td>
<td>Not available</td>
<td>28</td>
<td>Capacity until 3pm, w/days</td>
</tr>
<tr>
<td>Grace Street</td>
<td>Tertiary</td>
<td>Not available</td>
<td>27</td>
<td>Comparatively underutilised</td>
</tr>
</tbody>
</table>

Total - 1127
As described in Table 4.2 the number of available parking spaces is conversely related to a road's hierarchical classification - clearly engineers have designed the primary streets to cater for ease of access, higher average speeds and therefore greater safety levels of vehicles travelling these routes. Wider formations, less on-street parking and less attention paid to landscaping allows primary streets, such as Sandy Bay Road, Churchill Avenue and Regent Street, to cater for the demands of large volumes of traffic at the detriment of neighbouring residences. Secondary Streets such as Lord, Alexander and Grosvenor have narrow formations reflecting their lower traffic volumes. Ironically it is these streets that can provide parking services for University Patrons, encouraging this traffic to roam these local streets in search of space. The result is an increase in stationary and moving vehicles in local streets.

Free/Convenient Parking

The introduction of voucher parking areas within campus is a discouragement to full-time students - these areas allow for parking periods of no longer than 3 hours - such a restriction is often a financial and practical inconvenience. Accordingly those unwilling to suffer the consequences of such a system have been reduced in their on-campus possibilities and relocate into the free surface parking available in the residential streets.

The logistics of the campus building and parking layout are such that in the areas immediately surrounding the Lower Campus (catering for 70 - 80% of students) a total of 104 non-permit spaces are available. Parking available above Churchill Avenue is distant (and uphill) from this central core, and is separated by a primary road. Accordingly, students opt for the convenience of the close suburban streets.

Which Streets?

The street hierarchy of the study area described in Map 4.4 clearly singles out Sandy Bay Road and Regent Street/Churchill Avenue as the primary streets of the system, carrying in excess of 10,000 vehicles per day. What cannot be described from this hierarchy is the distinction between the usage of the secondary streets. Of the streets that are classified as secondary there is a variety of streetscapes:

(a) York Street (Figure 4.19)

York is the widest in formation of the secondary streets. It is flanked by 1.5 metre footpaths on both sides. Along the southern side of the formation the footpath is adorned with the occasional 2-3 metre deciduous tree. The street provides for parallel parking on both sides and is separated below Grosvenor and above Regent Street by a landscaped levelling island. The width of this street provides ease of access for through traffic between Sandy Bay Road and Churchill Avenue.

(b) Lord Street (Figure 4.20)

Lord Street is slightly narrower than York, again providing footpaths on both sides of the formation. West of Grosvenor Street the street is separated by a 2 metre wide deciduous landscaped island, whilst eastwards of this intersection the central island is replaced by the occasional deciduous on either side of the formation. The uninterrupted two sided parallel parking is provided with physical restrictions in this section.
FIGURE 4.19
YORK STREET

FIGURE 4.20
LORD STREET
(c) View and Grosvenor Streets (Figure 4.21)

These streets are effectively third scale miniatures of York Street. Similar landscaping is provided together with (apart from the occasional residential parking zone) identical parking provisions on a formation approximately 1/2 - 2/3 the width of York Street. The one area of exception is the length of Grosvenor Street between York and Lord Streets. In this section the formation has been narrowed to cater for a widened verge on the western side. On this side the footpath is separated from the formation by approximately 2.5 metres - providing an opportunity for residents to park within the street verge.

(d) Earl and Alexander Streets (Figure 4.22)

These streets were originally similar in design. Both provided a relatively narrow formation adorned with unlandscaped footpaths, and two-sided parallel parking. Alexander street has not been altered from this pattern. Earl street has been narrowed in formation by approximately 2 metres and provided with a landscape verge along its northern face. Parking has been restricted to one side, ironically the southern face adjacent to the residential buildings.

The variety of streetscapes exhibited by the secondary streets provides for a range of physical and practical reactions to the traffic volumes offered by University patrons; The narrower streets are both physically and practically affected by roaming traffic and parking 'clogging' the carriageway, and using residential parking areas - although houses in these streets are fairly close, they are semi-permanently separated by a sea of vehicles.

The wider streets, however, are physically capable of holding more traffic and visually appear less affected by the intrusion. Residents in these areas, although not physically affected, are subjected to high traffic volumes and total dissociation from the opposite side of the street.

(b) Public Transport

Character of the System

Hobart's hilly terrain and low density development has historically made most modes of public transport unviable. Urban Public Transport is currently provided in the form of a State Government run bus service - The Metropolitan Transport Trust (MTT). The MTT offers extensive services to most suburban and commercial areas. Depots are provided as collector centres in Rosny on the Eastern Shore, Glenorchy in the northern suburbs and the CBD. The depots effectively collect passengers from outlying suburbs to concentrate their points of destination (which may be other suburbs in the area or suburbs serviced by the other depots) For instance, a patron living in an outer northern suburb could catch a bus to Glenorchy from where he has the opportunity of catching a bus to another northern suburb, or a bus bound for either of the other depots. There is no means, however, of gaining direct access to the southern suburbs from the Springfield (or Rosny) Depots - these suburbs are serviced by the CBD Depot only.

All buses servicing the University (in the southern suburb of Sandy Bay) are therefore centred upon the CBD depot. Such a system is inconvenient in terms of time and money for patrons living in outer suburbs.
There are three routes passing the University from the CBD. Until September 1994 these routes were the Mount Nelson, Sandy Bay (Taroona) and Churchill Avenue Routes:

(a) Mount Nelson

This route runs along Regent Street and Churchill Avenue and up Nelson Road. The service runs every 30 minutes (at ten minutes past and twenty minutes to the hour) allowing for arrival at campus approximately 5-10 minutes before the 1/2 hour or hour.

(b) Churchill Avenue

This service ran half hourly (ten minutes behind Mount Nelson) along Regent Street from the CBD and along Churchill Avenue to Lower Sandy Bay.

(c) Sandy Bay (Taroona)

The Sandy Bay Service ran along Sandy Bay Road from the CBD to Lower Sandy Bay every 15 minutes on the hour. Every second service continued further south to Taroona.

All services concentrated on additional runs between 7.30 am and 9.00am to allow for times of peak demand. Inwards services were therefore available every 10 minutes, whilst access southwards from the campus was available every 15 - 30 minutes.

In September 1994 however, a new route was introduced replacing the Sandy bay and Churchill Avenue services. The new route (described on Map 4.5) termed the "Busy Bee" focuses upon servicing the commercial areas of Sandy Bay and the University every 10 minutes in a continuous rotation in correlation with the Mount Nelson and Taroona Services. This

new service provides a high standard of access for north bound and Sandy Bay patrons, but fails to improve the service to cater for the demands of Mount Nelson and Taroona patrons, who retain 30 minute services.

Outer Metropolitan Areas, such as New Norfolk, Kingston and Sorell, are not serviced by the MTT. Residents in these areas are very restricted in their access to Public Transport. These areas are serviced by the Private Company Hobart & Intercity Coaches with a variety of timetables.

(a) New Norfolk (42 km North of the CBD) is provided with nine (9) runs per day at an average interval of 1.5 hours.

(b) Sorell (approximately 30 km East of the CBD) is accommodated by two through services providing four runs to and from town per day.

(c) Kingston, an outer suburb of Hobart is serviced with twice hourly/hourly runs, depending upon the route.

The design of these routes is such that they focus solely on their points of destination, providing little opportunity for embarkation and disembarkation between point of origin and destination. Accordingly persons needing to use these runs for access to the City must travel to the CBD, disembark, and alight an MTT bus to reach their end destination point. There is a lack of co-ordination with timetables for these two services, making travel inconvenient. This situation, coupled with the infrequency of runs effectively reduces the attractiveness of public transport to patrons living in these outer lying areas - many have no choice but to drive their private cars.

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61 Hobart & Intercity Coaches 1994
MAP 4.5
ROUTE OF THE 'BUSY BEE'
BUS SERVICE

Source: "The Busy Bee" Metropolitan Transport Trust
Location/Quality of Stops

The position of Bus stops servicing the University are shown on Map 4.6. Three of these stops (all inwards routes) are provided with shelters and seating facilities. These facilities cater for no more than 6-8 people and are positioned immediately adjacent to the footpath. During periods of high patronage, pedestrian movement past these stops can be restricted, with people often being forced onto the street formation to pass. Those stops provided with no shelters are uncomfortable in bad weather and are less recognisable for the pedestrian or driver. Although some of the stops show "Busy Bee" timetables, no information is provided on the other routes, and scant information is provided on bus fares.

All stops appear to have been located to allow for maximum sight distance for following traffic whilst disregarding other street characteristics. Inward stops 14 and 15 especially allow for early warnings for following vehicles, but are hidden from on-coming traffic by bends or dips in the formation. The formation widths in these areas are relatively narrow and following traffic wishing to pass must traverse the centreline into (often unseen) on-coming vehicles. The danger, however, is more prevalent for pedestrians. No formal access is provided across either Churchill Avenue or Sandy Bay Road and in some areas no recognisable pedestrian path is provided from campus to these locations. Passing traffic is therefore often oblivious to the possibility of pedestrians crossing the formation.

The central location of the Churchill Avenue bus stops are convenient for most patrons. For those wishing to travel to Taroona however, the Sandy Bay Bus Stop is up to 1 kilometre from parts of the campus an inconvenient situation for intended patrons.

Legibility

Prior to approximately 1992 the MTT adopted a corporate colour scheme (gold green and white) which was carried in various designs by all its vehicles. Since that time, however, the Trust has commenced renting the space on bus panels for advertising - often resulting in an unrecognisable design- to date, a fair proportion of the fleet no longer carries corporate colours, or logo. To follow in this pattern, the Busy Bee service carries its own design, different again from the advertising buses and corporate designs. The result is a mix match of bus designs that offer no overall legibility for the potential patron - the system does not read as a system!

(c) Pedestrian Movement

No formal pedestrian routes are provided between the campus and the nearby commercial centres or major land uses. All streets in the study area provide a footpath on each side of the formation - but it is only in a small section of Grosvenor Street that these paths are physically separated from the formation through extensive landscaping. The number of streets that have the occasional deciduous tree planted in the footpath provide no mental barrier between the two surfaces. This pedestrian vulnerability has been recognised to some extent at points of intersection of secondary streets with Regent Street where footpaths have been bulged to narrow the formation crossing. The formation has also been paved to alert of not only pedestrians crossing but a downgrading in street status, from primary to secondary.

Directional signage for pedestrians is scant to non-existent. Street signage concentrates upon the driver and is inconspicuous in design and location.
MAP 4.6
BUS STOP LOCATIONS
(d) Bicycle Movement

No formal bicycle routes are provided to the campus from a southern or northern direction. Under Tasmanian Legislation\textsuperscript{62} bicyclists are confined to the street formation or to designated bicyclepaths. Access to the campus is available only via public streets where bicycles have to share space with passing traffic - cars, trucks and buses, as well as dodge parked vehicles.

Access to the campus from the CBD and southern suburbs is fastest along the primary streets. By virtue of their directness these streets negotiate steep hills and one-way traffic systems, making access difficult for bicyclists. Studies conducted by the Hobart City Council\textsuperscript{63} showed a daily traffic rate of:

440 bicycles on Sandy Bay Road
170 bicycles on Regent Street

When the relative accessibility of these two routes is compared, this differentiation is understandable. Sandy Bay Road runs along the River’s edge with a near 0 degrees slope. Regent Street/Churchill Avenue, however, are located 800m uphill of Sandy Bay Road, and must negotiate a number of steep ascents and descents. For residential areas relatively near to the campus but upslope of Sandy Bay Road (for example Dynnyrne and upper Sandy Bay) use of Sandy Bay Road for access is inappropriate. The alternative, however, is unattractive due to physical constraints and safety issues.

Use of secondary streets is low because, it is assumed, of their narrow formations (cramped with parked and moving cars) and their perceived indirectness. Even more so than pedestrians, bicyclists are the forgotten mode of transport in the area. No directional information is available to the bicyclist and no warning is issued to the car driver of their presence.

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\textsuperscript{62} Traffic (General and Local) Amendment Regulations (No.2) 1989

\textsuperscript{63} Hobart City Council May 1984 Map 3.1
Chapter 5

Recommendations

The intent of this Study is the instatement of policies and projects that allow the Study Area to develop as a sustainable environment. Central to this goal is the encouragement (physical or theoretical) to:

(a) reduce the usage of private transport for access to and from the University

(b) provide the residential area with an amenity that encourages community involvement and ownership (and happiness)

(c) provide a high standard of public transport, pedestrian and cycling services that are accessible and legible to every person

(d) provide a form of on-campus parking that acknowledges the space and slope restrictions of the title

The achievement of these objectives can be gained through the adoption of policies and projects that address each problem discussed in Chapter 5.

5.1 On Campus

(a) Parking Form and On-Site Residences

The Problem

- Parking is provided in spatially inefficient form and at inconvenient locations

- Provision is made on campus for approximately 12% of students needing accommodation. This lack of provision means a greater number of people have to travel to the campus than could otherwise be the case

The Options

Central to the future provision of parking and residents on campus is the issue of useable space. Of the area of the University title that has not been developed for sportsgrounds, buildings, streets and carparks, very little is available for future carparking. The western portion of the title is, in the majority, too steep for practical development. The only areas available for economically viable development are an area accessed off Olinda Grove at the top of Mount Nelson, and an area around the Residential colleges - Christ and St, John Fisher (Map 5.1).

The 1.3 kilometre distance of the Olinda Grove area from the remainder of the campus, together with the steepness of the separating land, removes any possibility of this area being used for faculty buildings or parking. Its isolation, however, could be used to accommodate a use that needs no direct association with the remainder of the campus - sporting facilities.

Sports grounds demand large areas of relatively flat land, but there is no practical reason for this land to be located in the immediate vicinity of the campus. In acknowledgment of this fact, the University has partially developed the Olinda Grove site for Soccer, Hockey and Cricket.

The area is obscured from surrounding residences and streets by extensive areas of bushland, and if further developed should have minimal impact on same. Services in
Map 5.1
The Olinda Grove Site
the area are currently substandard (dirt roads, no formal parking) but it is clear that the area could accommodate high numbers of patrons for a variety of sports concurrently, if developed thoughtfully.

Development of this area is considered of great importance to the future of campus parking. Consideration is given to the land area demand of existing campus sportsgrounds - up to 1/3 of the developed campus area is used for the Cricket/Football ground, Tennis and Netball courts, and Rugby/Hockey ground. These grounds are locate immediately adjacent to the main campus buildings, utilising precious flat land, and forcing buildings and vehicles to 'live' in evermore limiting spaces.

The two sportsgrounds are formally used for no more than 14 hours per week (including practice sessions), for limited periods of the year. The courts are used on a more regular basis, with usage during lunch hours being common. An argument exists for the retention of these courts in close proximity to the remainder of the campus. This argument does not hold for the larger grounds (open space is sufficient for the purposes conduction of informal football/cricket or rugby games). It is therefore suggested that one, or both of these grounds be relocated to the Olinda Grove site for the purposes of releasing land for development.

Such an option would provide land for carparking, and on-campus residential development.

The area of relatively flat land adjacent to the two existing Residential Colleges provides an obvious opportunity for an extension of the colleges or provision of alternative Residential development.

The religious basis of the existing Colleges would suggest that the opportunity should be used for the provision of a non-denominational College based upon the same design of those existing. The communal design of the Colleges allows for a limited demand on space, providing the opportunity for further bed provision. The hill-top location of the site, however, would demand care in design, and a restriction in height. The space provided however, would allow for a low impact, fragmented design of no more than two storeys, hidden from view by the surrounding bushland.

The University Bus Service currently servicing the Jane Franklin Residential Hall in South Hobart should be continued, whilst being expanded to service those University Patrons living in Dynnyrne and Upper Sandy Bay north of the Campus.

Recommendations

(a) That the Football/Cricket and Rugby grounds be relocated to the Olinda Grove site, and that this land be made available for development.

(b) To fully utilise the space provided by the removal of the sportsgrounds, carparking should be provided in multi-level form with direct access from Earl, Dobson, Alexander and Grosvenor Streets. The parking site should be provided immediately South of the Law faculty building between Dobson Road and the Tennis/Netball Courts, and should be designed in a manner that reflects the architectural integrity of the existing buildings, especially as seen from Sandy Bay Road. Depending upon its land area, this park should be no greater than five levels, and accordingly will require Hobart City Council approval for a variation to the maximum height provision.
The area between the proposed carpark and Earl Street should be developed as student residential housing, either in conjoined terrace form or as a ‘communal building’ of no more than three storeys designed to reflect the topography of the land as a visual association with the neighbouring suburban areas in terms of materials (brick), scale and bulk. Access to these residences should be made directly off Earl Street to reflect the residential accesses on the southern side of this road.

To ensure the area is developed in a form that is beneficial to all patrons, it should be provided with landscaped open space to be used by residents and day patrons alike.

The area of land uphill of Christ and St. John Fisher Colleges should be developed as a non-denominational Residential College. This College should provide dormitory design bedrooms for 100-150 students, with communal laundries, kitchens and bathrooms. The design should be of low visual impact, respecting the bushland setting being segmented in form and no higher than 2 storeys.

The University bus Service serving the Jane Franklin Hall should be expanded to accommodate the needs of University Patrons living between the Campus and South Hobart. This service should operate on a registration basis requiring all interested persons to register their interest at the commencement of each term. For this purpose a designated route should be declared allowing the introduction of University Bus Stops along the relevant residential streets.

### Parking Classification

#### The Problem

- Inequality exists in access to parking spaces between different categories of patrons - staff, students, disabled persons and visitors.

#### The Options

Apart from the Vice Chancellor, Deans and Heads of Schools, the majority of Australian Universities provide equal access to parking areas based upon a permit/voucher system. Although the parking systems for these Universities differ, all have had to introduce on-campus parking fees. The systems involve a variety of parking categories based upon a permit system available to all patrons.

Permits bought on an annual or semester basis would allow patrons to park on campus with no day to day charge. Access to a space, however, should not be ensured. Persons not wishing to pay this permit fee would be faced with the payment of a daily voucher fee. This fee must be determined by the relative costs of maintenance and construction of parking and consideration of student income.

Within such a structure, no priority would be given to staff over students.

#### Recommendations

(a) That a new parking system be imposed:

   (i) abolishing permit spaces;

   (ii) providing reserved spaces for Heads of Staff, Visitors and Disabled patrons;

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64 Refer University Western Sydney - Nepean, University of Technology Sydney, University of Western Australia, University of Wollongong, University of South Australia, University of Queensland.
(iii) introducing a semester permit system available to all staff and students - based upon an unlimited supply - allowing free day-to-day parking on campus upon display of permit;

(iv) introducing voucher machines for all non-reserved spaces, requiring all non-permit holders to pay a daily fee of no more than $3.00.

(v) reinforcing parking fines for illegal parking and non payment of fees.

(e) Parking Numbers

The Problem

• The number of spaces provided on campus is insufficient for patron demand.

The Options

• The introduction of a multi-level park recommended in 5.1 would allow for an increase in the number of spaces on campus

• The introduction of the new parking system recommended in 5.2 will allow more equality of access to on-campus parking.

• Provision of improved bus, pedestrian and cycling services is aimed at reducing the demand for on-campus parks.

• As student numbers grow, additional spaces should be provided at a rate equal to that recommended by the City of Hobart Planning Scheme 1982, that is 1 space per 10 students. These spaces should be located as close to the main campus area as practicable, and should be designed to maximise the use of space available. It should be noted that this could involve the redesign of the existing parking areas. For example, French Street is capable of accommodating angled parking along at least one of its sides - this would have a significant impact upon parking numbers in an area that would have no detrimental affect on nearby suburban areas.

Recommendations

(a) The design of all on-campus parking areas should be reconsidered to determine their capability of accommodating further spaces.

(b) As patron numbers grow additional spaces should be provided at a rate no greater than 1 space per 10 students/staff - in a form that best uses the available space (including the possibility of additional multi-level parks).

(d) Street Network/Pedestrians

The Problem

• On-campus streets are located inconveniently for pedestrians and bicyclists - intersections with pedestrian paths and through streets are inadequately defined creating potential conflict points for traffic, pedestrians and bicyclists.

• Distance between some Campus buildings is too great to allow ease of access between lectures, etc.

• Pedestrian access is poorly signed and landscaped.
Chapter 5 - Recommendations

- Access, egress and pedestrian movements in the stretch of Churchill Avenue between upper Nelson Road and French Street are highly dangerous.

The Options

- Cars must clearly acknowledge their status on campus. Traffic on campus is necessary only for access and egress, at all other times patrons are on foot (or bicycle). Pedestrians must therefore be the movement priority on campus. Campus streets therefore are primarily available for pedestrian access, secondarily bicycle access and thirdly vehicle access. In this light, it is necessary for the motorist to be fully aware of the continuing likelihood of pedestrian confrontation - he must be aware of this through relevant signage, reduced speed limits, variations in surfaces at major pedestrian crossings. This situation must be acknowledged at all points of entrance to the campus.

- In the past the University has provided a intra-campus bus service servicing the needs of College students wishing to travel the length of the campus. The patronage of this service is high at times of provision, and it is suggested by the author that this service could accommodate the needs of all students wishing to travel the length of campus in a hurry. The upgrading of the intra-campus service if adequately advertised and routed, could ease the burden on students frequently needing to traverse the campus for lectures.

- To ensure both through, local and patron traffic are fully aware of all traffic entrances and exits all should be clearly signposted in a manner that is clearly distinguishable from the surrounding landscape.

- Pedestrian paths should be adorned with signage and landscaped and lit to improve their visual appeal.

Recommendations

(a) All campus streets should restrict speeds to 20 km/h.

(b) All through streets traversing campus should restrict speeds to 40 km/h.

(c) The former intra-campus bus service should be upgraded concentrating on maintaining a high visual profile, servicing all major faculties for the purpose of allowing fast access from the extreme areas of the Campus. This service should include at least three buses carrying a minimum of 20 passengers each running at intervals that directly correspond with the completion and commencement of lectures.

(d) Signage should be erected upon entrance onto University land (including Churchill Avenue and French Street) advising of pedestrian and bicycle right-of-way.

(e) Major pedestrian crossings, as indicated on Map 5.2, are to be indicated by signage, vehicle slowing 'road humps' and applicable street markings.

(f) Entrances and Exits to the campus proper, as described on Map 5.3 are to provide clear advice of the change in traffic regulations, with entrances being clearly indicated.

(g) Services within the stretch of Churchill Avenue between upper...
MAP 5.3
ENTRANCES & EXITS TO THE CAMPUS
Nelson Road and French Street are to be redesigned in accordance with Diagram 5.1

(h) All pedestrian paths are to be illuminated and landscaped in a manner that creates 'softer' spaces. On paths longer than 50 metres furniture is to be provided in the form of benches and rubbish bins.

(i) Directional signs are to be located at intervals of no less than 100 metres on all major pedestrian routes indicated on Map 5.4. Such signage should indicate the direction and distance to all faculty buildings.

(j) Those pedestrian routes indicated on Map 5.4 are to be indicated by distinguishable paving for ease of legibility and access.

(e) Bicycle Facilities

The Problem

• Bicycles are forced to share narrow formations with traffic (in some locations, one-way).

• At their points of destination bicyclists are provided with inadequate supply of parking facilities.

The Options

The Traffic (General and Local) Amendment Regulations (No.2)1989 specify bicycles are permitted to travel:

(a) on the street formation with other vehicles;

(b) on a declared bicycle lane or path;

(c) on a shared or segregated footway.

Accordingly, if declared so, bicycles could travel the footpaths on campus as shared

All of these locations are open to the weather, offering no form of shelter. They are also positioned to allow for ease of access from the campus streets - this indicates the difficulty of access for bicyclists to the central axis where their way is hindered by steps. The one access available is along the major pedestrian paths between the Physics and Arts buildings, and northwards between the Central Library and the Chemistry building - this route (indicated on Map 5.5) is easily accessible from Dobson, Earl Street and Churchill Avenue. If dedicated as a shared footway, this route provides an opportunity for a central bicycle parking service.

Bicycle racks are provided in the following numbers:

<table>
<thead>
<tr>
<th>Building</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Sciences</td>
<td>4</td>
</tr>
<tr>
<td>Union Building</td>
<td>6</td>
</tr>
<tr>
<td>Law Building</td>
<td>4</td>
</tr>
<tr>
<td>Geography</td>
<td>6</td>
</tr>
<tr>
<td>Physics</td>
<td>26</td>
</tr>
<tr>
<td>Engineering</td>
<td>8</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>54</strong></td>
</tr>
</tbody>
</table>

or segregated footways. As such, pursuant to Regulation 16, bicyclists must not endanger or impede pedestrians in any way. In these situations pedestrian have right-of-way. Such a system should allow bicyclists the choice of formation or footway access whilst ensuring pedestrian's retain right-of-way in all situations. To enforce this situation it is suggested that drivers on through and campus streets receive signed warning of bicycle crossings and that these crossings be treated with dropped curbs to allow ease of access.
Diagram 5.1
Recommended Alterations
To Churchill Avenue

Introduce Pedestrian Crossing (including paving and signage)

Create Lay-by for Bus Stop

Enlarge Shelter for Bus Stop

Remove Main Exit

Widen Main Entrance to incorporate Exit

Reduce Street Gradient to improve sight distance for pedestrians & motorists
MAP 5.5
PROPOSED BICYCLE AXIS
Such a service could be located adjacent to the footway between the Arts and Physics buildings - designed in the form of a bikeport providing sheltered bicycle racks for up to 50 bicycles. If patronage of this parking service is high, the University should consider providing shelters for other parking areas.

Recommendations

(a) All on-campus footpaths (save those in the central axis) should be dedicate as shared footways in accordance with Regulation 2(d) of the Traffic (General and Local) Amendment Regulations (No.2) 1989, designated by Sign Numbers 33 (Shared Footway), 37 (End), and 38 (No Bicycles) at appropriate locations. Pedestrians should have right-of-way over these routes.

(b) All streets passing through campus must warn traffic of bicycle crossing locations, as indicated by Map 5.6. Traffic must give way to bicycles at the points. Dropped curves should be provided at these points to allow for ease of access for bicyclists.

(c) The major pedestrian route running north-south, eastwards of the Central Library and the Arts building should be dedicated as a shared footway in accordance with (a). At the southern end of this route, between the Arts and Physics buildings, a covered bicycle parking facility should be provided in the form of an open-sided roofed shelter providing bicycle racks for up to 50 bicycles.

(d) Bicycles should be permitted to park in designated parking spaces for no charge. To facilitate this provision, wooden structures are to be located adjacent to at least 10% of all parking spaces to allow for the securing of bicycles.

5.2

Off Campus

(a) Street Design/Parking facilities

The Problem

- University patrons use neighbouring suburban streets for access to the campus and for convenient parking locations.
- Street design of through streets fails to deter patron traffic, thereby affecting the amenity of residential areas.
- Design of through and local streets does little to reduce the visual impact of vehicles.
- Services for pedestrians on through and local streets range in quality with often little imagination given to their design.
- Services for bicyclists are non-existent

The Options

All of the above problems could be solved though the introduction of a comprehensive street design system. This system should consider the needs of residents, residential visitors, patron vehicles, pedestrians, bicyclists and public transport patrons.

Recommendations

Table 5.1 provides a recommended street system aiming at:

(a) Accommodating vehicles in streets that can visually and physically cope.
MAP 5.6
MAJOR BICYCLE CROSSING
LOCATIONS
### Table 5.1

**Recommended Alterations to Street System**

<table>
<thead>
<tr>
<th>Street Section</th>
<th>Current Description</th>
<th>Recommended Formation</th>
<th>Recommended Pedestrian Services</th>
<th>Recommended Bicycle Services</th>
<th>Recommended Intersection Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lord - Proctors to Regent</td>
<td>Central landscaping, two-sided parking, 1.5m footpaths, no verge, narrowed curves at intersection with Regent</td>
<td>Central parking, 2 hour/Residential</td>
<td>No change</td>
<td>No formal provision</td>
<td>Bicycle and pedestrian warning signs</td>
</tr>
<tr>
<td>Lord - Regent to Sandy Bay</td>
<td>Mixture of central and footpath landscaping, two-sided parking, 1.5m footpaths, no verge, narrowed intersection with Regent</td>
<td>Two-sided parallel landscaped parking</td>
<td>No change to southern side, widen northern</td>
<td>Provide segregated footway on widened northern footpath</td>
<td>Provide bicycle and pedestrian crossings and signage at intersections</td>
</tr>
<tr>
<td>York - Proctors to Regent</td>
<td>Uneven section separated by landscaped island, even section with central landscaping, two-sided parking, 1.5m footpaths, narrowed intersection with Regent</td>
<td>Uneven section - no change to form 2 hour/Residential zone</td>
<td>No change</td>
<td>No formal provision</td>
<td>Bicycle and pedestrian warning signs</td>
</tr>
<tr>
<td>York - Regent to Sandy Bay</td>
<td>Verge landscaping, two-sided parking, 1.5m footpaths, narrowed intersection with Regent</td>
<td>Two-sided parallel introduction with Regent</td>
<td>No change</td>
<td>No formal provision</td>
<td>Bicycle and pedestrian warning signs</td>
</tr>
<tr>
<td>View - Proctors to Regent</td>
<td>Verge landscaping, two-sided parking, 1.5m footpaths, narrowed intersection with Regent</td>
<td>Chicane, angled landscaped parking, 2 hour/Residential zone</td>
<td>Widen footpaths to 1.5m</td>
<td>No formal provision</td>
<td>Pedestrian/bicycle warning signs at Regent Street intersection</td>
</tr>
<tr>
<td>View - Regent to Grosvenor</td>
<td>Verge landscaping, two-sided parking, narrowed formation, 1.5m footpaths, narrowed intersection with Regent</td>
<td>Chicane, angled landscaped parking, 2 hour/Residential zone</td>
<td>Widen footpaths to 1.5m</td>
<td>No formal provision</td>
<td>Pedestrian/bicycle warning signs at Regent Street intersection</td>
</tr>
<tr>
<td>STREET SECTION</td>
<td>CURRENT DESCRIPTION</td>
<td>RECOMMENDED FORMATION</td>
<td>RECOMMENDED PEDESTRIAN SERVICES</td>
<td>RECOMMENDED BIKE SERVICES</td>
<td>RECOMMENDED INTERSECTION TREATMENT</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>--------------------------------</td>
<td>---------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>View - Grosvenor to End</td>
<td>Verge landscaping, two-sided parking, 1m footpaths, very narrow formation, dead end, area of restricted residential parking zones</td>
<td>No change</td>
<td>Wide footpaths to 1.5m</td>
<td>No formal provision</td>
<td>Signage at Grosvenor Street intersection restricting access to residential traffic only</td>
</tr>
<tr>
<td>Alexander - Proctors to Regent</td>
<td>No landscaping, two-sided parking, 1m footpaths, narrow formation, areas of restricted residential parking zones</td>
<td>Chicane, angled landscaped parking, 2-hour residential zone</td>
<td>No change</td>
<td>No formal provision</td>
<td>Pedestrian/bicycle warning signs at Regent Street intersection, left turn only into Regent</td>
</tr>
<tr>
<td>Alexander - Recent to End</td>
<td>No landscaping, single-sided parking, 1m footpaths, area of restricted residential parking zone</td>
<td>No change</td>
<td>Wide footpaths to 1.5m</td>
<td>No formal provision</td>
<td>Pedestrian/bicycle warning signs at Regent and Grosvenor Street intersections, left turn only into Regent</td>
</tr>
<tr>
<td>Adams Street</td>
<td>No landscaping, two-sided parking, 1.5m footpaths, chicane, angled landscaped parking</td>
<td>No change</td>
<td>No change</td>
<td>No formal provision</td>
<td>No requirements</td>
</tr>
<tr>
<td>Grosvenor - Lord to York</td>
<td>Widened landscaped verge on western side, two-sided parking, 1.5m footpaths, narrow formation</td>
<td>No change</td>
<td>Wide western footpath to 3 metres</td>
<td>Provide segregated footway on widened western footpath</td>
<td>Provide for bicycle turning facilities (signage and markings) at Lord Street intersection, &quot;NO&quot; signage required at entrance to Grosvenor above Lord Street</td>
</tr>
<tr>
<td>Grosvenor - York to Alexander</td>
<td>Verge landscaping, two-sided parking, 1m footpaths, area of restricted residential parking on eastern side, retaining restricted residential zone on eastern side</td>
<td>Parallel landscaped parking on eastern side, parallel parking on western side</td>
<td>Wide footpath on western side to 3 metres</td>
<td>Provide segregated footway on widened western footpath</td>
<td>Provide for bicycle crossing facilities at intersection with Verge and Alexander streets, &quot;Segregated footway&quot; signage required at intersection with Alexander Street</td>
</tr>
<tr>
<td>STREET SECTION</td>
<td>CURRENT DESCRIPTION</td>
<td>RECOMMENDED FORMATION</td>
<td>RECOMMENDED PEDESTRIAN SERVICES</td>
<td>RECOMMENDED BIKE SERVICES</td>
<td>RECOMMENDED INTERSECTION TREATMENT</td>
</tr>
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<td>----------------------------------------------------------</td>
<td>------------------------------------------</td>
<td>---------------------------------</td>
<td>----------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Grace Street</td>
<td>NO LANDSCAPING, TWO SIDED PARKING, 1.5M FOOTPATHS</td>
<td>CHICANE, ANGLED LANDSCAPED PARKING</td>
<td>NO CHANGE</td>
<td>NO FORMAL PROVISION</td>
<td>NO CHANGE REQUIRED</td>
</tr>
<tr>
<td>Regent - Alexander to Lord</td>
<td>CENTRAL LANDSCAPING, TWO SIDED PARKING, 1.5M FOOTPATHS, WIDE FORMATION</td>
<td>REMOVE CENTRAL LANDSCAPING, RESTRICT PARKING IN PEAK HOURS</td>
<td>WIDEN FOOTPATHS TO 3M, PROVIDE LANDSCAPING IN VERGE</td>
<td>PROVIDE SEGREGATED FOOTWAY ON WIDENED FOOTPATHS</td>
<td>PROVIDE CYCLE AND PEDESTRIAN CROSSING FACILITIES AT INTERSECTIONS</td>
</tr>
<tr>
<td>Sandy Bay - CBD to Nelson</td>
<td>AREAS OF CENTRAL LANDSCAPING, AREAS OF TWO SIDED PARKING, FOUR TRAFFIC LANES, 1.5M FOOTPATHS</td>
<td>REMOVE CENTRAL LANDSCAPING, RESTRICT PARKING IN PEAK HOURS</td>
<td>WIDEN FOOTPATHS TO 3M, PROVIDE LANDSCAPING IN VERGE</td>
<td>PROVIDE SEGREGATED FOOTWAY ON WIDENED FOOTPATHS</td>
<td>PROVIDE CYCLE AND PEDESTRIAN CROSSING FACILITIES AT INTERSECTIONS</td>
</tr>
<tr>
<td>Earl Street</td>
<td>VERGE LANDSCAPING ON NORTHERN SIDE, PARKING ON SOUTHERN SIDE ONLY, 1.5M FOOTPATHS, NARROW FORMATION, AREAS OF RESIDENTIAL PARKING ON SOUTHERN SIDE, LARGE VERGE SERVICE FOOTPATH ON NORTHERN SIDE</td>
<td>LANDSCAPED PARALLEL PARKING ON NORTHERN SIDE, NO EXISTING VERGE AREA AND WIDTH TO 2.5M</td>
<td>RELOCATE FOOTPATH ON NORTHERN SIDE, ALLOW ONLY RESIDENTIAL PARKING</td>
<td>PROVIDE SEGREGATED FOOTWAY ON ALL FORMS OF TRAFFIC FROM PRIMARY ROAD</td>
<td>PROVIDE TRAFFIC CONTROL AT INTERSECTION WITH SANDY BAY ROAD TO ALLOW ALL FORMS OF TRAFFIC FROM PRIMARY ROAD</td>
</tr>
<tr>
<td>Churchill - Queen to Nelson</td>
<td>SEE DIAGRAM 5.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proctor - Lord to View</td>
<td>NO LANDSCAPING, SINGLE SIDED PARKING, STEPS IN VERGE PREVENTS MUCH PARKING ON EASTERN SIDE, 1.5M FOOTPATHS</td>
<td>LANDSCAPED PARALLEL PARKING ON WESTERN SIDE, PROHIBIT PARKING ON EASTERN SIDE</td>
<td>WIDEN FOOTPATHS TO 2 M</td>
<td>NO FORMAL PROVISION</td>
<td>PROVIDE PEDESTRIAN CROSSING FACILITIES AT INTERSECTIONS WITH LORD, YORK AND AVENUE STREETS</td>
</tr>
<tr>
<td>French Street</td>
<td>NO LANDSCAPING, TWO SIDED PARKING, 1.5M FOOTPATHS, WIDE FORMATION</td>
<td>TWO SIDED LANDSCAPED PARALLEL PARKING</td>
<td>WIDEN FOOTPATHS TO 2M</td>
<td>NO FORMAL PROVISION</td>
<td>PROVIDE PEDESTRIAN CROSSING FACILITIES AT INTERSECTION WITH VIEW AND AVENUE STREETS, AND LOCATION INDICATED BY MAP 5.2</td>
</tr>
<tr>
<td>STREET SECTION</td>
<td>CURRENT DESCRIPTION</td>
<td>RECOMMENDED FORMATION</td>
<td>RECOMMENDED PEDESTRIAN SERVICES</td>
<td>RECOMMENDED CYCLE SERVICES</td>
<td>RECOMMENDED INTERSECTION TREATMENT</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>---------------------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>QUORN STREET</td>
<td>VERGE LANDSCAPING, TWO SIDED PARKING, 1.6M FOOTPATHS, NARROW FORMATION, AREAS OF RESIDENTIAL AND SCHOOL PARKING RESTRICTED AREAS</td>
<td>RESTRICT LONGER TERM PARKING TO WESTERN SIDE ONLY. ALLOW TEMPORARY PARKING ASSOCIATED WITH RESIDENCES AND SCHOOL ALONG EASTERN SIDE</td>
<td>WIDEN EASTERN FOOTPATH TO 1.5M</td>
<td>NO FORMAL PROVISION</td>
<td>NO CHANGE NECESSARY</td>
</tr>
<tr>
<td>DAVID STREET</td>
<td>VERGE LANDSCAPING, TWO SIDED PARKING, 1.6M FOOTPATHS, NARROW FORMATION, AREAS OF RESTRICTED RESIDENTIAL PARKING</td>
<td>NO CHANGE</td>
<td>NO CHANCE</td>
<td>NO FORMAL PROMOTION</td>
<td>SIGNAGE AT QUORN STREET INTERSECTION RESTRICTING ACCESS TO RESIDENTIAL TRAFFIC ONLY</td>
</tr>
<tr>
<td>NELSON - SANDY BAY TO CHURCHILL</td>
<td>NO LANDSCAPING, AREAS OF TWO AND ONE SIDED PARKING, 1.5M FOOTPATHS, AREAS OF RESTRICTED RESIDENTIAL AND SCHOOL PARKING, LARGE AREAS OF NO PARKING ZONES ALONG SOUTHERN SIDE</td>
<td>NO CHANCE</td>
<td>NO CHANCE</td>
<td>NO FORMAL PROVISION</td>
<td>NO CHANGE REQUIRED</td>
</tr>
</tbody>
</table>
Restricting patron parking in short, narrow residential streets.

Providing an assortment of parking forms using traffic calming measures that best reflect the needs and uses of each street.

Slowing traffic in all but the widest streets.

Providing a visual interpretation of each road’s function through street form.

Providing a constant high standard of pedestrian access - with concentration given to street intersections.

Providing a comprehensive bicycle route to the University from both southwards and northwards of the campus.

Diagram 5.2 visually describes the street forms discussed in Table 5.1

**Public Transport**

The Problem

- Public transport within Inner Metropolitan Hobart is limited to a State Government run Bus System. No choice in transit type is available to would-be public transport patrons.

- All bus services are centred upon the CBD, providing economical and time disincentives for persons travelling from the eastern and northern suburbs.

- Bus Services for patrons living in outer Metropolitan areas are not provided by the MTT. Timetables and routes are inconvenient and lack coordination with the MTT Services.

- Bus services for the suburbs of Taroona and Mount Nelson are too infrequent - priority has been given to inner Sandy Bay patrons.

- Few bus stops are provided with effective shelter and are positioned in locations that can give rise to dangerous traffic and pedestrian situations.

- Most bus stops are provided with insufficient timetable and fare information.

- Introduction of advertising and distinction of new ‘Busy Bee’ route has lead to a variety of Bus designs - no constant design exists making legibility difficult.

- The locations of bus stops and relevant bus routes are not clearly advertised. Are Stops at convenient locations for patrons?

The Options

- Possible alternative public transport forms are restricted in Hobart because of its topography and small population. Heavy rail is not an option within the Study area because of the absence of any public-rights-way to accommodate the route. Many suggest that the Light Rail option would be feasible. Within the Study area the topography would limit any route for such a system to Sandy Bay Road. Traffic volumes on this road exceed 20,000 vehicles per day. The introduction of a Light Rail route along this formation, coupled with the suggested implementation of bicycle facilities, would severely limit the formation space available for vehicles, creating congestion problems. The Sandy Bay Road location would have the
additional setback of distance from the Campus proper (approximately 1 kilometre). Current bus patron numbers show a low patronage of services along this street. Within the scope of this Study, therefore, it is suggested that Light Rail is not a feasible public transport option. The physical, economical implications of such a system would require an integrated regional system accommodating patrons from a number of major land uses and across a number of dense suburban areas.

- The MIT must begin to acknowledge that students need to travel directly from northern or eastern suburbs to the University. A change to the system that would allow for access from the southern suburbs to the northern and eastern locations without a changeover in the CBD could only improve the attractiveness of bus travel for potential patrons. Additional 'direct run' services could accommodate the needs of all the community at regular intervals throughout the day. These services could be based at the Lower Sandy Bay 'Depot' and provide runs to the Rosny and Springfield Depots - thereby accommodating more patrons in a more direct route. University patrons using these services should be rewarded with a reduced fare, as a financial incentive.

- Consideration should be given to the possibility of providing a limited number of services from outer areas direct to the University campuses on-route to the CBD.

- Bus services for the Mount Nelson and Taroona routes should be surveyed by the MTT to determine their rates of usage. Consideration should be given to the use of these routes by University and School patrons to determine any need to upgrade the frequency of trips.

- All bus stops within the University grounds should be provided with shelters set back from the footpath to remove any possibility of interference with passing pedestrians. All of these stops should be provided with up-to-date timetables for all applicable routes, together with documentation on relevant fares.

- As discussed in Chapter 4, use of the public transport system depends upon its legibility as a system. A lack of constant design between vehicles servicing the same system creates confusion for potential patrons. The MTT should concentrate on recreating a corporate image removing any extensive forms of advertising, and allowing for the continuation of a corporate design and colour scheme. Additional relevant bus routes should be highly legible and accessible for the resident, visitor and University patron. Clear and concise routes provided along primary (together with a limited number of secondary) streets should allow most potential patrons to never be far from a stop.

Recommendations

(a) Additional bus services should be provided to service the Study Area. These services should be applicable during University semester periods providing direct runs between Lower Sandy and the Rosny and Springfield Depots, with no changeover in the CBD. Such routes should be available at a frequency of
no less than 20 minutes, and should allow general public patronage for all suburbs between the starting point and end destination. University patrons should be provided with a discount fare on these routes.

(b) Hobart & Intercity Coaches should investigate the viability of providing direct peak hour services to the University from outer lying suburbs not serviced by the MTT.

(b) The MTT should investigate the (University) patronage of Mount Nelson and Taroona Services to determine the impact of improved frequency of these routes.

(c) All Bus Stops within the University Grounds should be provided with shelters capable of accommodating up to 20 patrons. These shelters are to be located away from passing footpaths to allow ease of access for passing pedestrians.

(d) All Campus bus stops except Numbers 14 (Regent Street) should be provided as a lay-by in the formation, thus minimising any potential traffic and pedestrian confrontations.

(e) All bus stops should be provided with up-to-date timetable information for all applicable routes, relating the time of arrival at the subject stop, as well as documentation on relevant fares.

(f) The MTT should recreate a corporate design and implement this design on all buses to allow for the reinstatement of a legible system of public transport. Within this design route differentiation and advertising could be included but should be kept to a minimum.

(g) Bus Routes within the Study area should be concentrated along the primary routes of Churchill Avenue, Regent Street and Sandy Bay Road, together with limited use of the more heavily used Grosvenor, York, Alexander, French Streets, Proctors and Nelson Road. These routes and the location of associated Stops should be clearly defined through signage advertising each street as a Bus Route, and directing patrons to the nearest Stop.

(c) Pedestrian Movement

The Problem

- There is a lack of landscape barriers between pedestrians and passing traffic.
- Dangers exists for pedestrians at street intersections.
- There is a lack of directional signage for pedestrians within the streets of Study Area.

The Options

- The changes to parking and footpaths recommended in Table 5.1 should incorporate landscaping and parking forms that provide a continuous physical barrier between pedestrians and traffic.
- The change to intersections recommended in Table 5.1 should provide an increased alertness for traffic to surrounding pedestrians. Specifically all intersections with primary streets should be provided with widened footpaths, warning signage and differential paving.
- Signage should be provided at intersections directing pedestrians to
major land uses, bus stops and major streets.

Recommendations

(a) Parking and footpath designs recommended in Table 5.1 are to ensure a feeling of physical separation of the pedestrian from the formation. Landscaping is to be evergreen, at a height of no less than 2 metres.

(b) All recommendations made in Table 5.1 relating to intersection alterations are to place pedestrians as the highest priority.

(c) Directional signage should be provided at intersections giving information on the location of major land uses (schools, University, commercial centres, churches and parks), bus stops, phone booths, and major streets. This signage should be easily distinguishable and should be legible for pedestrians, bicyclists and traffic.

(d) Bicycle Movement

The Problem

- No formal bicycle routes are provided within, or to, the Study Area, accordingly bicycles are required to share the formation with traffic and parked cars.

The Options

- The Traffic (General and Local) Amendment Regulations (No.2) 1989 allow for bicycle routes through the introduction of bicycle lanes or shared/segregated footways. The options available on the streets within the Study Area:

(a) Wide Curbside lanes (at least 4 metres) accommodating a moving car and a bicycle where a 'No Standing' sign is in force. This mode is most appropriate on multi-lane streets along which parking is prohibited. The bicycle logo should be stencilled into the pavement at regular intervals and bicyclist route information employed. This mode may be a possibility for Sandy Bay Road if longer lengths were provided as "No Standing" areas. This is not practical however, because of its traversing of the Sandy Bay Shopping Centre, where on-street parking is necessary to accommodate the parking demands of the area.

(b) Shared Bicycle/Parking lanes provide for bicycle travel on the traffic side of parked vehicles, and require a formation width of approximately 4 metres. As with (a) this mode provides visual announcement of the bicycle route for the benefit of both bicyclists and drivers. Apart from signage, and stencilled logos, however, the bicyclist is no safer in this situation than on a non-designated route - physically sandwiched between the parked car and the passing traffic.

(c) Segregated Footways provide a widened footpath (approximately 3.0 metres) for the use of pedestrians and bicyclists. The footpath is divided in half (sometimes physically through the use of barriers) separating the pedestrian and bicycle space. If treated carefully, with pedestrians given

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55 Bicycle Track Committee 1980 pp 6-10
priority, these segregated footways can allow for the safe travel of both modes along primary and secondary streets. Through the use signage at the commencement, end and crossing points of the footway bicycle traffic can be treated identically to pedestrian traffic.

Recommendations

(a) Segregated footways are to be provided in locations recommended in Table 5.1, allowing easy bicycle access along Sandy Bay Road, Regent Street, Churchill Avenue, Grosvenor and Lord Streets and Earl Street. These routes are to be treated with the appropriate signage pursuant to Regulation 26 traffic sign Numbers 36 (Segregated Footway), 37 (End) and 38 (No Bicycles), together with surface signage in the form of the bicycle logo at intervals of 100m. The footway is to be segregated through the use of concrete barriers of no less than 15cm in height.

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66 Traffic (General and Local) Amendment Regulations (No.2) 1989
Chapter 6

CONCLUSION
Chapter 6

Conclusion

The implementation of transport strategies is central to the establishment of sustainable development patterns. Provision of policies and strategies that provide for the visual enhancement of streets, the restriction on vehicle movement in applicable areas, the establishment of economical disincentives, and the accommodation of alternative forms of movement are policies that are simply executed but are legible and accessible to the general community.

Within Post Industrial Western Society Sustainable Development policies must be used to curb current development patterns whilst allowing individuals the opportunity for choice.

The implementation of policies that impose ‘must not do’ strategies will not be accepted by communities who affectively wish to retain the status quo. Accordingly they must attempt to provide alternatives through physical provision and advertisement that can be understood by the average individual.

The University of Tasmania is a prime example of an opportunity waiting to be addressed. The social standing of the Tertiary Educational system within the Tasmanian Community places the University Body in a position where, through positive manipulation policies can be implemented that could affect the future development of the remainder of the Hobart City.

The strategies and implementations recommended in Chapter 5 are particular to the Study Area. However, the underlying gist of those strategies are applicable Country wide.

This Study aimed to:

(a) Identify options available to the University and suburban community to improve and control the problems associated with University traffic and parking

(b) Develop and formulate recommendations to reduce the overall use of energy and creation of greenhouse emissions in travel to and from the Study Area.

Within this aim, it has

(a) Discussed the impact of street form and traffic volume upon suburban identity and suggested means of controlling traffic speeds, volumes, and awareness of surroundings through the implementation of traffic calming measures;

(b) Considered the role of public transport in the reduction of private vehicle usage, and discussed the options available, including the suggestions for variations to the current system;

(c) Discussed the role of bicycling and walking as means of transport and applicable means of accommodating same;

(d) Highlighted the importance of legibility of the systems provided through the use of signage, and improved services (for example surfacing, landscaping, seating, road markings);
(e) Provided suggestions for improved parking systems that allow equal accessibility for all patrons, whilst introducing an overall parking fee strategy;

(f) Suggested means of providing more accommodating on campus to reduce travel to and from the area.

The recommendations include strategies that will have to involve the cooperation of the University, the Hobart City Council, the Metropolitan Transport Trust and, not the least, the Community. The situation will not improve unless all recommendations are implemented. Failure of the Council to provide the recommended segregated footways, for example will provide the University with little incentive to improve on-campus accommodation for bicycles. Whilst the establishment of the recommended on-campus parking system will only push patrons into the residential streets unless the recommended alterations are made to same. The message - change will not occur until feasible options are available and all aspects of transport have been considered.

The recommendations made in this paper will not be applicable to all situations. However, it is suggested that of the options discussed, and the theories reviewed many would be applicable to other areas of high traffic flow and parking pressure where the issues remain constant and only the specifics vary.

As such this Study hopes to highlight the issues together with the opportunities to those involved in traffic management and land use control, to ensure those regulations discussed within Legislation and Planning Schemes can be turned into physical advertisements of Sustainable Development.
Appendix 1

Excerpts from the City of Hobart Planning Scheme 1982

Part 5.

Zone Objectives & Statement of Desired Future Character

The Sandy Bay / Dynnyrne Precincts - Nos. 27A & 27B

Clause 5.7.7

These Precincts should continue to function as an inner residential area with a range of accommodation types from large family houses to smaller houses and flats, and accommodation for students. A slightly higher density of development is encouraged in Precinct 27A in comparison to Precinct 27B.

The Lower Sandy Bay Precinct No.30B

Clause 5.8.7

The Precinct should continue to be characterised by predominantly single family detached houses supported by a limited number of medium density housing developments and a range of small local shops. Further development of offices and non-local shops should be discouraged.

The environmental character of the Precinct should be derived from the existing high quality of development and mature gardens of the many early residences.

The beaches and waterfront between Sandy Bay point and Wrest point should be accessible to the Public.

The University Precinct No. 29

Clause 5.17.1

The Precinct should continue to develop as a major tertiary education centre of the State. The Precinct should contain a diversity of activities primarily catering for the education, recreation and entertainment of its student population while also encouraging a closer integration with the community.
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